

EVERYMAN'S ENCYCLOPAEDIA

IN TWELVE VOLUMES
VOLUME THREE



LONDON: J. M. DENT & SONS LTD

J. M. DENT & SONS LTD.
Aldine House · Bedford Street · London
Made in Great Britain

at

The Aldine Press · Letchworth · Herts

Paper supplied by

The Ryburndale Paper Mills Co. Ltd

First edition 1913-14

ABBREVIATIONS

The titles of subjects, which are printed first in bold type, have been abbreviated within each article to the initial letter or letters.

ac., acre(s).
 agric., agricultural.
 ambas., ambassador(s).
 Amer., American.
 auct., ancient.
 ann., annual.
 arron., arrondissement.
 A.-S., Anglo-Saxon.
 A.V., Authorised Version.
 b., born.
 Biog. Dic., Biographical Dictionary.
 bor., borough.
 bp., birthplace.
 Brit., British.
 c., about.
 C., Centigrade.
 cap., capital.
 cent., century (7th cent.).
 chem., chemistry.
 co., county.
 com., commune.
 cub. ft, cubic feet.
 d., died.
 Dan., Danish.
 dept., department.
 dimin., diminutive.
 dist., district.
 div., division.
 E., east; eastern.
 eccles., ecclesiastical.
 ed., edition; edited.
 educ., educated.
 e.g., for example.
 Ency. Brit., *Encyclopædia Britannica*.
 Eng., English.
 estab., established; establishment.
 fl., flourished.
 Flem., Flemish.
 fort. tn, fortified town.
 Fr., French.
 ft, feet.
 Ger., German.
 Gk., Greek.
 gov., government.
 Heb., Hebrew.
 hist., history.
 horticult., horticultural.
 h.p., horse-power.
 H.Q., headquarters.
 hr(s), hour(s).
 in., inch(es).
 inhab., inhabitant(s).
 is., island(s).
 It., Italian.
 Jap., Japanese.
 jour., journal.
 Lat., Latin.

lat., latitude.
 lb., pound(s).
 l. b., left bank.
 long., longitude.
 m., mile(s).
 manuf., manufacture(d).
 M.E., Middle English.
 min., minute(s).
 Mod. E., Modern English.
 m.p.h., miles per hour.
 mrkt tn, market town.
 MS., MSS., manuscript(s).
 mt, mts, mount, mountain(s).
 N., north; northern.
 N.T., New Testament.
 O.E., Old English.
 O.F., Old French.
 O.T., Old Testament.
 oz, ounce(s).
 par., parish.
 parl., parliament.
 pop., population.
 prin., principal.
 prof., professor.
 prov., province; provincial.
 pub., published; publication.
 R., riv., river.
 R.A.F., Royal Air Force.
 r. b., right bank.
 rep., republic.
 Rep. of Ireland, Eire.
 R.N., Royal Navy.
 Rom., Roman.
 r.p.m., revolutions per minute.
 R.V., Revised Version.
 S., south; southern.
 sec., second(s).
 sev., several.
 Sp., Spanish.
 sp. gr., specific gravity.
 sq. m., square miles.
 temp., temperature.
 ter., territory.
 tn, town.
 trans., translated; translation.
 trib., tributary.
 U.K., United Kingdom.
 U.N., United Nations.
 univ., university.
 U.N.O., United Nations Organisation.
 urb., urban.
 U.S.A., United States of America.
 vil., village.
 vol., volume.
 W., west; western.
 Wm, William.
 yd(s), yard(s).

Cana of Galilee, vil. of Palestine, the traditional scene of Christ's first miracle (John ii). Now called Kefr Kenna.

Canaan, 'low lands'; according to Numbers xiii. 29, a name applied to the low coastland of Palestine, on the Mediterranean, as opposed to the mt. lands. It is first met in the 14th-cent. Amarna Tablets designating Phenicia and Palestine. But in the Bible it generally indicates Palestine W. of Jordan.

Canada. The dominion of C. was constituted by the British North America Act of 1867, which united the various colonies of Brit. N. America. The first colonies to unite were upper and lower C., Nova Scotia, and New Brunswick; what had formerly been the Hudson's Bay Co. ter. was bought by the dominion and formed into the provs. of Manitoba and the NW. Ter. These were admitted into the confederation in 1870. In the following year Brit. Columbia joined the union, and in 1873 Prince Edward Is. Out of the NW. Ters. in 1905 were carved the 2 new provs. of Saskatchewan and Alberta, leaving under dominion administration the dists. of Mackenzie, Keewatin, and Ungava. Newfoundland joined in, as the tenth prov. in 1949. C., as now formed, is bounded on the N. by the Arctic Ocean, on the W. by the Pacific Ocean and Alaska, on the E. by the Atlantic, and on the S. by the U.S.A.

The dividing line between C. and the U.S.A. is the middle line of Lakes Superior, Huron, Erie, and Ontario, and to the W. of the Lake of the Woods the parallel of 49° N. lat. The middle line of the St Lawrence as far as the parallel of 45° N. forms the boundary E. of the Great Lakes; then the boundary line runs by that parallel to Hall's Stream, the most westerly of the headwaters of the Connecticut R., and by that stream to its head. The water-parting of the St Lawrence basin is the continuation of the

CHIEF CITIES OF CANADA

<i>City</i>	<i>Pop. 1951</i>
Montreal, Quebec	1,395,400
Toronto, Ontario	1,117,470
Vancouver, Brit. Columbia	550,728
Winnipeg, Manitoba	354,069
Ottawa, Ontario	281,908
Quebec, Quebec	274,827
Hamilton, Ontario	259,685
Edmonton, Alberta	173,075
Windsor, Ontario	157,672
Calgary, Alberta	139,105
Halifax, Nova Scotia	133,931
London, Ontario	121,516
Victoria, Brit. Columbia	104,303
St John, New Brunswick	78,337
St John's, Newfoundland	67,749

boundary to about 46° N., when it is continued by arbitrary straight lines between the St John R., the Grand Lake, and the Croix R. as far as Passamaquoddy Bay on the Atlantic. The whole of the N. part of the continent, including the Arctic Is. W. of Greenland, is Canadian ter., with the exception of Alaska, which belongs to the U.S.A.

Physical features. The is. of the Arctic Archipelago, through which a NW. passage to the E. of Asia was vainly sought for many years, have gained new importance in the air age. The Atlantic and the Pacific shores are well supplied with deep bays which form magnificent harbours. On the Atlantic coast the chief indentations are the Bay of Fundy, which is remarkable for its high tides and 'bores,' the Gulf of St Lawrence, and Hudson Bay, which has an area of over 350,000 sq. m. The Pacific coast has no such vast bays, and is smaller in extent than the Atlantic coast, but it is broken up in a noteworthy manner by fiords.

LAND AND WATER AREA OF CANADA, BY PROVINCES

<i>Prov. or Ter.</i>	<i>Land sq. m.</i>	<i>Fresh Water sq. m.</i>	<i>Total sq. m.</i>
Newfoundland (including Labrador)	147,994	7,370	155,364
Prince Edward Is.	2,184	—	2,184
Nova Scotia	20,743	325	21,068
New Brunswick	27,473	512	27,985
Quebec	523,860	71,000	594,860
Ontario	333,835	78,747	412,582
Manitoba	219,723	26,789	246,512
Saskatchewan	220,182	31,518	251,700
Alberta	248,800	6,485	255,285
Brit. Columbia	359,279	6,976	366,255
Yukon Ter.	205,346	1,730	207,076
NW. Ters.	1,253,438	51,465	1,304,903
Canada	3,562,857	282,917	3,845,774

Canada

There are a good number of ls. off the coasts. Vancouver Is. and Queen Charlotte Is. are the most noteworthy off the Pacific coast; Prince Edward Is., Cape Breton Is., and Anticosti on the Atlantic side. Of the 10 provs. only Saskatchewan and Alberta have no outlet on the oceans. Plains and undulating lowlands make up the surface to the E. of the Rocky Mts. Large tracts in the N. are composed of tundras similar to those of N. Russia and Siberia; these descend as far as the 58th parallel on the W. shore of Hudson Bay, and extend still further E. along the whole coast of Labrador. The whole of the dominion E. of Lake Winnipeg, except the area mentioned above and the portions

Canada

(10,000 sq. m.), Lake Ontario (7260 sq. m.). The prin. rivs. are St Lawrence (1900 m.), flowing into the Atlantic; Saguenay (405 m.) and Ottawa (685 m.), its tribs., Hamilton (600 m.) in Labrador, which also flows into the Atlantic; Dubawni (580 m.), Severn (420 m.), Attawapiskat (465 m.), Albany (610 m.), Big (520 m.), Nottaway (400 m.), Koksoak (535 m.), Kaniapiskau (445 m.), flowing into Hudson Bay; Columbia (465 m. in Canada), Fraser (695 m.), Yukon (1765 m.), flowing into Pacific Ocean; Mackenzie (2525 m.), Liard (550 m.), Athabasca (765 m.), Peace (1065 m.), Coppermine (525 m.), Back's (605 m.). The prin. mts are (1) in the Yukon dist.: Mts Logan



Canadian Government

BOW RIVER VALLEY, BANFF

cleared for agriculture, is covered with forests of pines and firs. The prairie lands succeed this region in the W. of the dominion; these are of greatest extent on the tablelands immediately to the E. of the Rocky Mts. The prairie region rises in what are known as the 3 prairie steps from E. to W. The Red R. valley is the lowest level, with an altitude of about 750 ft; the surface rises to 1500 ft W. of that valley, and then extends westwards, forming a terrace of about 250 m. in extent; after that the ground rises rapidly to 2000 ft, then rises in a more gradual slope to the foothills of the Rockies. All the land forming these prairies is of the highest importance from an agric. point of view, as the soil is fertile and the climate is favourable for agriculture. To the E. of the Great Lakes no outstanding physical features are to be found. The Laurentian Mts skirt the St Lawrence on the N.; the S. range terminates in the cliffs of Gaspé.

Lakes, rivers, and mountains. The prin. lakes are Lake Superior (area 31,800 sq. m.), Lake Michigan (22,400 sq. m.), Lake Huron (23,200 sq. m.), Lake Erie

(19,850 ft), Lucania (17,150 ft), Steele (16,044 ft), Wood (15,855 ft); (2) in Brit. Columbia: Mts Waddington (13,280 ft), Wilfrid Laurier (11,750 ft), Sir Sandford (11,634 ft); (3) in Alberta: Mts Robson (12,972 ft), Columbia (12,294 ft). See also ROCKY MOUNTAINS.

Geological formation. The geological structure of C. is of very great physical features. Archaean and other crystalline rocks extend over very large continuous areas, and where such rocks prevail the earth covering is as a rule only a thin layer spread over a hard foundation. Over this thin earth many rivs. flow with innumerable turns and windings, and there are a number of lakes of varying sizes, some joined together, others isolated. The whole area from the lower St Lawrence to the shores of Lake Winnipeg is composed almost entirely of Archaean rocks. The surface features of this region are similar to those of the unorganised ter. of the NW., where granite is known to prevail over very large areas. Silurian rocks succeed the Archaean in the E. of the dominion, with one or two patches of Cambrian; these formations extend along

Canada

a narrow piece of land bordering the St Lawrence from a little below Quebec and occupying the whole area between the St Lawrence and lower Ottawa. The area between Lake Ontario and Georgian Bay, together with the N. part of Lake Huron, extending nearly as far N. as the Mada-waska R., is composed of the same class of rocks; the SW. part of the lake peninsula between Lake Erie and Lake Huron is composed of rocks of the Devonian period. Lakes Manitoba and Winnipegosis are also almost surrounded by Devonian

Canada

healthy on the whole. E. of the Rocky Mts the climate of the dominion has those extremes of temp. which are prevalent all over the N. hemisphere in the same lats., save in those regions which are exposed to S. westerly winds from the sea. The difference in the climates of W. C. and Europe is mainly due to the fact that the area between the Rocky Mts and the Pacific is mountainous in character, and the mts extend at right angles to the prevailing winds and parallel with the coast. For this reason great



Alberta Government Photograph

FRANK SLIDE, ALBERTA

rocks. The Archaean rocks near Lake Winnipeg are succeeded by Silurian and Devonian strata, which stretch westwards in strips running parallel with Lake Winnipeg and Lake Manitoba. To the W. of these formations a vast area of Cretaceous deposits is found, of which the precise limits have not yet been determined. Tertiary rocks are found here and there to the westward of the above area, and the geology of the mountainous tract in the W. is much too complicated to be dealt with in detail. Over almost the whole of the dominion glacial deposits are found, and in some places there are aqueous deposits; the rich soil of the Red R. valley in Manitoba is formed by aqueous deposits.

Climate. The climate of C. is characterised by greater extremes of heat and cold than that of Great Britain, but is

contrasts both of rainfall and temp. are found close to the Pacific. The total precipitation is very scanty to the E. of the Rocky Mts as far as E. Assiniboia, when it begins to increase again. Since the future of the Canadian W. still depends largely on its cultivation of wheat, the peculiarities of the climate as affecting this industry must be borne in mind. Most of the total precipitation takes place during the summer months; a considerable proportion of the precipitation is in the form of snow. This is the case throughout the dominion of C., but in a much greater degree in the E. than in the W. From this snowfall springs in each part of the country a different advantage for the cultivation of wheat. The great advantage of the snow in the E. region, where the precipitation is distributed more equally throughout the year, is that it

protects the ground against the severe frosts. Therefore in those regions 'fall' or winter wheat can be grown. In Manitoba, Saskatchewan, and Alberta the frost precedes snow, and spring wheat only can be grown. But the melting of the frozen water in the spring furnishes moisture at the time when it is wanted, save in the very dry parts of this region, where irrigation is receiving the attention of the gov. as well as of private individuals. The rainfall does not determine the amount of the produce so much as whether or not frost occurs before harvest. The risk of crops being ruined in this manner is being lessened by the careful choice and cultivation of hardy varieties of wheat, which ripen quickly. Spring in C. commences in April, 2 or 3 weeks later than in England, but by the middle of July the crops of the latter country can claim no advantage in their condition. June, July, Aug., and Sept. may be said to constitute the summer, and from Oct. to the middle of Nov. is the autumn. The remaining portion of the year, from the middle of Nov. to the end of March, is the winter. Although cold temps. are frequently found, the Canadian air is generally dry and exhilarating, and the climate in consequence salubrious. The temp. in the winter in dists. near to the mts is mitigated by warm winds, which blow from the SE., S., or SW. on the westward side of the Rocky Mts, and from the SW., W., or NW. on the E. side. These winds are known as chinook winds, and they account for stock-raising being an important industry in Alberta, as these winds cause the cold of winter to alternate with periods of warm weather when the ground is cleared of snow and the grasses flourish.

Canals and waterways. Canals were the earliest large transportation works in C. One of the first locks was a small one constructed by the Hudson's Bay Co. at Sault Ste Marie, which was destroyed by U.S. troops in 1814. Another was built at the Lachine rapids in the St Lawrence above Montreal in 1825, followed by the Welland Canal in 1829 to overcome the obstacle of Niagara Falls. The Rideau Canal between Kingston and Ottawa (then Bytown) was built 1826-1832 for defence purposes. The locks at Sault Ste Marie were built 1887-95, and the St Lawrence system from 1884 to 1914. In modern times the Great Lakes-St Lawrence system has become one of the busiest waterways in the world; more traffic passes through the locks at Sault Ste Marie (mostly iron ore from Duluth for the U.S. ports on Lake Erie) than through the Suez and Panama Canals combined. The grain and ore carriers which operate of the upper lakes run to 715 ft in length and carry up to 22,500 long tons, in sharp contrast to the small vessels of about 2500 tons deadweight which are able to navigate the old 14-ft canals on the St Lawrence below Prescott. *Vast works now under way, said to be the greatest single construction project in hist. (see ST LAWRENCE SEAWAY), will open up that riv. to ocean-going ships of 25-ft*

draught by 1959. This is the navigable depth of the upper lake system, the Welland Canal locks being 30 ft deep. It is 2200 m. from the Atlantic to the head of the lakes. Traffic through the locks at Sault Ste Marie in 1953 comprised 25,604 ships and 128,480,170 net tons of cargo; through the Welland Canal, 19,542,150 tons; and through the St Lawrence canals, 10,081,992 tons.

Railways. See CANADIAN RAILWAYS.

Highways. Canadians own more motor vehicles (1 to every 4 persons) than any other nation in the world except the U.S.A. The registration in 1954 counted 2,688,465 passenger cars, 856,851 trucks, 9860 buses, 37,665 motor-cycles, and 51,748 other vehicles; total, 3,644,589. Ontario had 1,489,980 of these registrations, Quebec 674,114, and Newfoundland only 34,423. Most of these vehicles were made in C. 1953 production reaching 373,072 units. Although over \$1 billion were spent on new highways during 1946-53, the density of vehicles per mile of surfaced road increased in this time from 11.6 to 18.0. In 1954 total expenditure by federal, prov., and municipal govts. on highway building and maintenance reached \$600 million. Roads are a prov. responsibility, and it has not yet been possible to secure the co-operation of all the govts. in completing a Trans-C. highway (q.v.) of high standard, although the federal gov. offered in 1949 to pay half the cost. Quebec has refused its co-operation, and there is also a gap of 180 m. in N. Ontario. Of the total mileage, 4580, outside of Quebec, 2863 was paved by the end of 1955. The total of paved highways in C. was 30,731, gravelled 160,265, and unsurfaced 326,812 m. in 1953. New 4-lane highways, such as the one being completed across Ontario, from Windsor to Montreal, are of a very high standard. So far none of these charges tolls.

Airways. Airline traffic between large centres has developed in C., much as in many other countries, but 'bush flying,' freighting to the mines and outlying communities of the N., has always been very important too. Also aerial surveying and forest patrolling have been very highly developed in C. Trans-C. Air Lines (T.C.A.), a publicly owned company organised in 1937, holds a monopoly in transcontinental traffic, and also in Canadian air traffic across the Atlantic and to the W. Indies. Canadian Pacific Air Lines (C.P.A.), formed in 1942 by an amalgamation of most of the small 'bush' operators, is allowed to operate 'feeder' lines, mostly running northward from the transcontinental system. C.P.A. also operates transpacific lines from Vancouver to New Zealand and Australia, China, and Japan, a line from Toronto to Mexico City, and one across the N. Pole from Vancouver to Amsterdam. In 1954 T.C.A. flew 852,475,532 passenger m., and C.P.A. flew 198,803,192 passenger m. Non-scheduled air services play a big role in mineral exploration and development, and in the Mackenzie region offer the chief means of transport of freight as

well as passengers and mail. These 198 operators carried 340,347 passengers and 27,855 tons of freight in the year ended 31 Mar. 1955. Other operations which they carry out are crop-dusting, patrolling power-lines, estimating timber, planning pipelines, policing the N., providing ambulance service, and carrying missionaries. The International Civil Aviation Organisation (I.C.A.O.) of the U.N. has its permanent H.Q. in Montreal.

Pipelines. With the rapid exploitation after the Second World War of the oil-fields of Alberta, and to a lesser extent Saskatchewan, a number of notable pipelines have been constructed in C. The Interprovincial Pipeline carries oil 1765 m. from Edmonton to Sarnia, Ontario (960 m. being through the U.S.A.), with a capacity of 250,000 barrels per day. The Transmountain Pipeline runs from Edmonton to Vancouver (718 m.), and has a branch crossing into the state of Washington. A pipeline from Portland, Maine, U.S.A., carries Venezuela crude oil to refineries in Montreal. Construction began in 1955 on the Trans-C. Pipeline, to carry gas from Alberta to industrial E. C.; it will be the longest pipeline in the world.

Telephones and telegraphs. The telephone was invented in C. by Alexander Graham Bell of Brantford, Ontario, and C. ranks only behind the U.S.A. and Sweden in the number of telephones, 25 per 100 pop., or 3,860,269 telephones, in 1954. It was estimated in that year that there were 1644 calls per telephone, or 418 per head of pop. Although the Bell system in Ontario and Quebec covers 60 per cent of all the telephones in C., there are 2787 other telephone companies, including the provincially owned systems serving the 4 W. provs. All companies combine to give very efficient long-distance service, and 138 million long-distance calls were placed in 1954, inside C. or to the U.S.A. Facilities are already being introduced in Toronto and Montreal which will enable long-distance calls to be dialled direct to many points in N. America. A submarine cable laid in 1956 between Nova Scotia and Scotland will allow more reliable transatlantic telephone service. Six transoceanic telegraph cables also terminate in C., 4 on the Atlantic coast and 2 on the Pacific. A micro-wave radio relay system for telephone use is being built across C., to be completed in 1958.

Postal service. The first exclusively Canadian postal service was estab. in 1788, consisting of a monthly courier route from Halifax to Quebec. The letter rate, which was 5c. in 1851, was reduced to 3c. at Confederation, and to 2c. in 1897; in 1956 it was back at 5c. The railways are still the chief mail carriers, but all first-class mail which will go faster by air is sent that way without extra charge.

Radio and television. Radio broadcasting in C. is under the control of the Canadian Broadcasting Corporation (C.B.C.), which is run on lines similar to the Brit. Broadcasting Corporation.

The C.B.C. has a monopoly of network broadcasting, but permits private stations to operate on a local basis under its regulation. A publicly owned corporation, it is subsidised by the gov., the receiver licensing system having been dropped in 1952. C.B.C. policy is determined by a board of 11 governors whose role is to guard the national interest. C.B.C. operates 22 standard-band AM stations, 5 FM stations, and 54 small 'repeater' transmitters which work automatically and serve sparsely settled areas. There were 157 privately owned radio stations in 1955. More than a million school-children listen regularly to the C.B.C.'s Friday school broadcast. A Fr. language service is operated in Quebec prov., and at some points in W. C. C.B.C. also operates an International Service for the Dept. of External Affairs. Many programmes on the C.B.C., and almost all programmes on the private stations, carry advertising, in the Amer. manner. Television was introduced into C. in 1952, although many Canadians along the border were watching U.S. programmes before that. C.B.C. policy reserves the larger cities for itself, but permits private television stations in the smaller centres. By 1956 there were 8 C.B.C. and 28 private stations operating. All private stations are required to carry 10½ hours of C.B.C. programmes per week. The coast-to-coast network is expected to be completed in 1958. Already television was said to be available to 75 per cent of the pop. by 1956, with 1,900,000 receivers in use.

Shipping. While Canadian foreign trade has increased steadily until it is now exceeded only by that of the U.S.A., the U.K., and W. Germany, Canadian shipbuilding has fluctuated enormously. In the mid 19th cent. wooden shipbuilding flourished in the Maritimes, but a decline set in which continued until 1914. After a spurt during the First World War shipbuilding became almost dormant, until only 9 berths were available for large ships. The Second World War brought a big expansion: 345 cargo vessels of 3,392,700 tons were built, 454 naval escort vessels, and 2882 other vessels and special purpose craft. At the peak, in 1943, 75,000 workers were employed in 90 large and small yards. Since the Second World War the industry has again declined sharply, failing to attract foreign orders. By 1954 only 24 ocean ships remained in Canadian registry. In trade with countries other than the U.S.A., Canadian ships carried only 1,202,938 out of a total of 26,734,184 tons. Trade with the U.S.A., totalling 36,270,337 tons, reflected the much healthier position of Canadian shipbuilding and operation on the Great Lakes and in the coastal trade. Canadian vessels carried 55.7 per cent of this commerce.

Fisheries. C.'s fishing-grounds are perhaps the most extensive in the world. They comprise the Bay of Fundy, 8000 sq. m. in extent; the Gulf of St. Lawrence, over 10 times that size; and other ocean waters, of a total area of 200,000 sq. m.,

or four-fifths of the fishing area of the Atlantic. In addition, there are 15,000 sq. m. of Atlantic inshore waters controlled entirely by the dominion, Hudson Bay, and the Pacific coast. The quality of the product is yet more important than the extent of the grounds, owing to the purity and coldness of the waters. Canadian cod, halibut, herring, mackerel, whitefish, and salmon are the equal of any in the world. Fishing is C.'s oldest industry, but it is only in the past 60 or 70 years that it has become a big one. The advent of the steam trawler greatly

mechanised curing; 62,000 Canadians now find their livelihood in fishing, and in 1954 they landed an estimated 2,000,000,000 lb. of fish. The figures for 1953 were 1,845,500,000 lb. with a marketed value of \$174,227,000, of which 499,200,000 lb. were landed in Newfoundland. Lobster, cod, and haddock are the chief fish caught on the Atlantic coast, in that order of value, but salmon caught on the Pacific coast is by far the most valuable catch. The salmon catch in 1954 was the heaviest since 1913. Halibut was also a record. The figures for



Nova Scotia Bureau of Information
TUNA FISHING NEAR YARMOUTH, NOVA SCOTIA

increased the fish haul in the 1890's, and also brought a serious threat of depletion. To combat this C. has entered into numerous international treaties to protect the halibut and salmon of the Pacific coast, the fisheries of the NW. Atlantic, and, more lately, to combat the predatory lamprey in the Great Lakes. There have been 2 outstanding events in the Canadian fishery world in recent years—the union of Newfoundland with C., which added about one-third to the Canadian fish catch, and the success with fish ladders on the Fraser R., Brit. Columbia, in gradually restoring the immensely valuable salmon run on this stream. There has also been a technological revolution in this ancient occupation. Larger sea-going vessels with modern navigational and fish-locating devices are coming into use, and filleting and packing freezing plants prepare much of the catch for the fresh fish market. At the same time, home-curing is giving way to

1953 show a salmon catch of 186,914,000 lb. with a value of \$47,936,000; lobster, 41,920,000 lb., value \$19,718,000; cod, 189,296,000 lb., value \$13,897,000, all exclusive of Newfoundland.

The dominion dept. of fisheries, established on a separate basis in 1928, controls the tidal waters of the maritime provs., and Brit. Columbia the fisheries of the 3 prairie provs. and the fisheries of the Magdalen Is. in Quebec prov. The non-tidal fisheries of the maritime provs. and Ontario, and both the tidal and non-tidal fisheries of Quebec (except the Magdalen Is.), are controlled by the respective provs., but the right of fisheries legislation for all provs. rests with the dominion gov. The main object of legislation has been the prevention of depletion, the enforcement of close seasons, the forbidding of pollutions and obstructions, and the regulation of nets, gear, and of fishing operations generally.

Minerals and mining. Something of C.'s

Canada

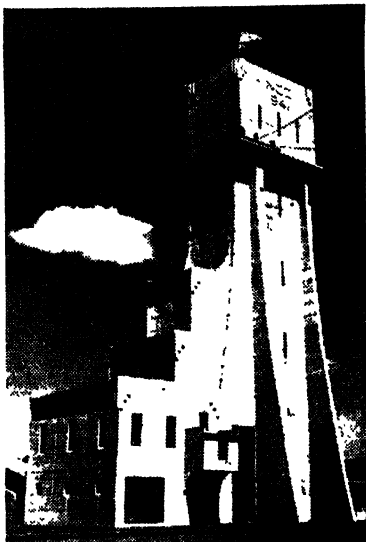
riches in minerals was revealed when blasting for the Canadian Pacific Railroad near Sudbury, Ontario, in 1883 disclosed the nickel deposit which still to-day supplies 83 per cent of the free world's needs; and similar blasting near Cobalt, Ontario, for the N. Ontario Railroad in 1903 uncovered the largest silver deposit in the world. In the 3 decades that followed, gold discoveries in this same area made C. the second gold producer in the world. In 1939 gold production was valued at \$184,000,000 and was greater than all base metals combined, and equal to 40 per cent of all mineral production. To give some measure of the vast exploration and development effort which has been going on, although gold production was \$157,000,000 in 1955 it was in fourth place behind petroleum, copper, and nickel, and closely followed by zinc, iron, and asbestos (also aluminium, which, because the bauxite is imported, is ranked as a manufacturing rather than a mining industry in C.). Metal output tripled during 1939-55, from \$344,000,000 to \$1,001,513,368, and the total of all minerals and structural materials increased from \$475,000,000 to \$1,778,398,272. Metals mined in quantity are, in order of value, copper, nickel, gold, zinc, iron, lead, silver, pitchblende, platinum, palladium, cobalt, tungsten, magnesium, calcium, and selenium.

Coal has also been mined since the earliest times in C., the mines of Cape Breton, which now project under the sea, being the first worked in America. There is no coal in central C., where industry (largely powered by hydro-electricity) is mainly located, but in Alberta there are immense deposits of bituminous coal. It is in this remarkable region that numerous oilfields have been brought into production since the Second World War; and the same area has also the vast Athabasca tar sands, still unexploited, and said by some to be the largest single oil reserve in the world. In 1955 280 companies spent \$400,000,000 in developing prairie oilfields. Oil production was 129,000,000 barrels in 1955, and reserves were placed at over 2,500,000,000 barrels, 33 times the estimate of 1946. Natural gas reserves were estimated at 20 trillion cub. ft. The second great development of recent years is the opening up of great high-grade iron ore deposits in Ungava. A 360-m. railway has been built into the heart of this once impenetrable ter. as far as Knob Lake, and in 1956 work started on a 43-m. branch line to Wabush Lake, where low-grade iron has been found. Further extensive deposits have been located S. of Ungava Bay. Knob Lake output jumped from 2,240,000 tons in 1954 to 9,520,000 tons in 1955, and reached 12,155,000 long tons in 1956. On completion of the St Lawrence Seaway it may reach more than 20,000,000 tons. With Steep Rock, Ontario, mines scheduled to produce 11,000,000 tons by 1960, and Wabana's Bell Is., Newfoundland, production now stepped up to 3,900,000 tons, the prospect is that C. will

Canada

be producing 35 million tons of iron ore per year by 1960. Actual 1955 output was 17,377,000 tons.

Recent years have seen great excitement over uranium, which has been found in rich deposits at Beaverlodge, on Lake Athabasca, and in huge low-grade deposits at Blind R., Ontario. Sev. of the world's largest reduction mills have been installed at these places. Other important new mining discoveries or developments are nickel at Lynn Lake, Manitoba; copper in NW. Brit. Columbia, at Manitouswage, Ontario, Chibougamau



International Nickel Co.

A CONCRETE HEADFRAME OF THE INTERNATIONAL NICKEL CO. OF CANADA, NEAR SUDBURY, ONTARIO

and Gaspé, Quebec, and in Newfoundland; lead-zinc at Bathurst, New Brunswick, and at Pine Point, Great Slave Lake. The 1955 output of minerals was as follows: crude petroleum \$303,561,100, copper \$239,394,952, nickel \$216,433,694, gold \$157,305,152, zinc \$116,425,122, iron ore \$113,385,503, asbestos \$98,690,514, lead \$55,786,929, silver \$24,625,797, pitchblende \$23,000,000, platinum \$14,715,000, salt \$10,286,210, gypsum \$8,455,173, palladium \$8,118,000, cobalt \$7,723,500, tungsten \$6,465,638, sulphur \$5,560,800, titanium dioxide \$5,091,000. Coal production in 1955 was down somewhat at 14,578,821 tons, worth \$92,237,215. Cement production was 25,860,103 barrels at \$64,363,165. C. ranks first in the world in the production of nickel, second in aluminium and zinc, and fourth in copper and lead. The explanation for all

this mineral development is quite simple, and may be found in the U.S.A. *Paley Report* describing the rapid depletion of that country's mineral resources and its need for developing other sources.

Cash Income from Farm Products—1954

Source	\$ '000
Grains, seed, and hay	630,426
Vegetables, other field crops	167,710
Livestock	841,535
Dairy products	426,188
Fruits	46,380
Eggs, wool, honey, maple products	125,433
Miscellaneous farm products	44,634
Forest products sold off farms	83,336
Fur farming	12,192
Total	\$2,377,834

Agriculture. Nothing shows the change that has been going on in C. since the Second World War better than the decline in importance of agriculture's share of the national production and income. Until the First World War it was pre-eminent. Manufacturing passed it in importance in the early 1920's, and by 1939 income from manufacturing was double that from agriculture (the latter having suffered heavily from the depression). This ratio was maintained in 1946, agriculture having regained prosperity. But by 1953 income from manufacturing was 3 times that from farming, and this trend continues. Farm income is now exceeded by that from the forest industries (lumbering and pulp and paper), and is only a shade ahead of income from mineral production. Farm production has nevertheless continued to increase

all this time, and to become more diversified, though the number of people earning their livelihood on farms dropped from 1,364,000 in 1939 to 889,000 in 1954; 2,800,000 Canadians live on 623,000 farms, with a total acreage of 174,000,000, or an average of 275 ac. per farm. Farming is carried on in every prov., though 83 per cent of the total farm produce is grown in the 4 provs. of Quebec, Ontario, Saskatchewan, and Alberta. The special crop of the Maritimes is potatoes. In Quebec dairy farming, fruit, and tobacco growing and market gardening thrive, as well as the tapping of maple trees for their sweet syrup—a \$10,000,000 ann. crop.

Ontario farming, concentrated in the triangle between Lakes Huron, Erie, and Ontario, is more productive than that of the broad reaches of Saskatchewan, partly because of its S. location, in the same latitude as N. California. Here sufficient tobacco is grown to cover all Canadian requirements; soybeans, hybrid corn, sugar beets, vegetables for packing, quick freezing, or immediate consumption in the cities; most of the grapes used in the Canadian wine industry; and many other kinds of fruits and berries. There is also a flourishing dairying industry. In the prairie provs., besides the vast dry areas under wheat, oats, barley, and flax, there are nearly a million ac. under irrigation. Cattle and sheep ranching dominates in the foothills. Beyond the Rockies, in B.C. and Columbia, are the lush Kootenay, Okanagan, and coastal valleys, and Vancouver Is., famous for fruit and potatoes. Farm techniques have been changing in C., with the introduction of more and more machinery which intensifies the trend towards specialisation, because certain machines are better suited to certain crops. Three-quarters of Canadian farms are electrified; and in Ontario their consumption of electricity per farm more than doubled in the decade 1944-54. In this same prov. the number

PRINCIPAL FIELD CROPS—1955

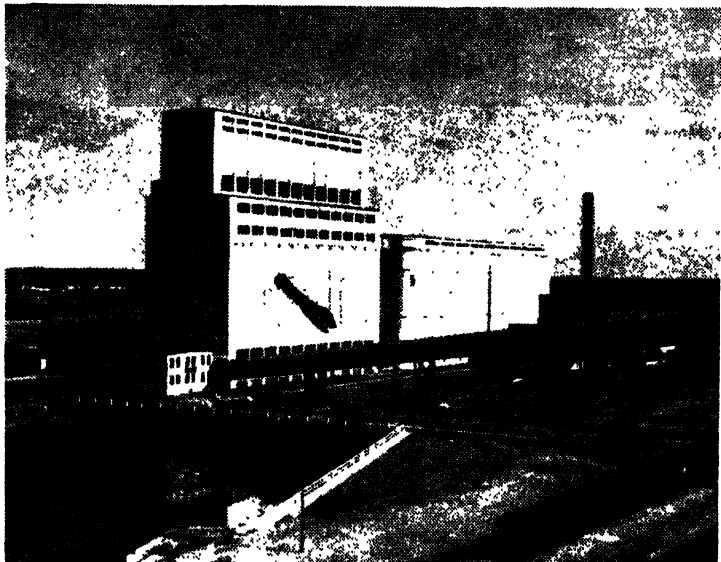
PRINCIPAL FIELD CROPS—1955			
Crop	Area	Yield per Acre	Production
	Thousands of Acres	Bushels	Thousands of Bushels
Wheat	21,504	23.0	494,090
Oats	11,178	36.1	403,835
Barley	9,912	25.4	251,781
Rye	778	18.9	14,711
Flaxseed	1,988	10.8	21,498
Mixed grains	1,705	38.2	65,154
Corn	507	62.1	31,510
Soybeans	214	26.4	5,650
Potatoes	308	206.2	63,578
Thousands of			
Sugar beets	82	Tons	Tons
		11.39	933
Thousands of			
Tobacco	117	lb.	lb.
		104	122,200

of tractors increased 3 times and combine harvesters 13 times in the period 1941-51. In consequence 27 per cent fewer workers grew 28 per cent more farm produce, an increase in productivity per worker of 75 per cent since 1939.

With the increased ease of work has come greater ease of living on the farm, so that in the better farming areas of E. C. farm people live in much the same style as city dwellers, with automobiles, television, fur coats, oil heating, and all manner of electrical appliances, including the 'deep-freeze' in which fresh-frozen

Price Support legislation of 1944 it establs. and supports the price of various commodities, notably butter and pork (wheat is handled separately).

All grains are marketed by the Canadian Wheat Board, a federal gov. agency, the Winnipeg Wheat Exchange having been closed down during the Second World War. There is a delivery quota for each farmer based upon bushels per 'specified' ac., the 'specified' acreage consisting of each permit holder's acreage seeded to wheat (other than durum), oats, barley, or rye, plus his acreage in summer fallow.



Manitoba Travel and Publicity Bureau

GRAIN ELEVATORS AT CHURCHILL, MANITOBA

vegetables, fruit, fish, meat, and ice-cream can be kept. They have their bread delivered at the door, do their shopping at a super-market, and never think of making butter or slaughtering a pig. The farmers' prosperity, which reached its post-war peak in 1951-2, in which year Canadian farmers had a gross income of over \$3,500,000,000, as against \$2,624,732,000 in 1954 and about the same in 1955, has mainly derived from the general prosperity of the country, but much credit must also be given to the federal and prov. depts. of agriculture. These carry on extensive experimental and research work, and operate schools of agriculture at univ. level. A very large part of the biological research in C. is carried on under their auspices. The federal gov. also controls marketing, including grading and inspection. Under

This system does not satisfy everyone, but few are eager to take back from the gov. the problem of marketing the large surplus of grain which has accumulated during the 1950's. The Canadian wheat crop has been little larger in the decade following the Second World War than it was in the decade following the First World War, but it has proved much harder to dispose of. Briefly, the story runs thus: the first 100,000,000 bushel wheat crop was raised in 1905. Within 10 years a crop almost 4 times as great was raised, the 393,000,000 bushels of 1915. During the 1920's the average was 400,000,000 bushels, topped by 566,000,000 bushels in 1928. In the 1930's the average fell to 300,000,000, with a low yield of 182,000,000 in 1937. For the war years the average was 400,000,000, and in the crop years 1946-

1955 it was 465,000,000 bushels. Two tremendous crops, in 1952 and 1953, of 701,000,000 and 613,000,000 bushels, glutted all storage facilities.

Forestry and forest industries. From earliest days lumbering has been one of C.'s chief occupations, but a far-reaching change has come over this industry in the past generation. For over 30 years the output of 5,000,000,000 ft board measure of sawn lumber in 1911 stood as the record, under the old, ruthless type of exploitation of the 'inexhaustible' forests. With

The forests consist of 8 main regions, by far the largest being the Boreal, which sweeps across mid C. from the Atlantic to the Rockies and forms 82 per cent of the total. This is the pulpwood stand, notably spruce, but also tamarack, balsam fir, and jackpine, with deciduous poplar and birch in large numbers. The other regions are the Coast (of Brit. Columbia), where the giant Douglas fir, red cedar, and hemlock cedar grow, the Montane (Columbia), Subalpine (on the E. slopes of the Rockies), Aspen Grove (N.

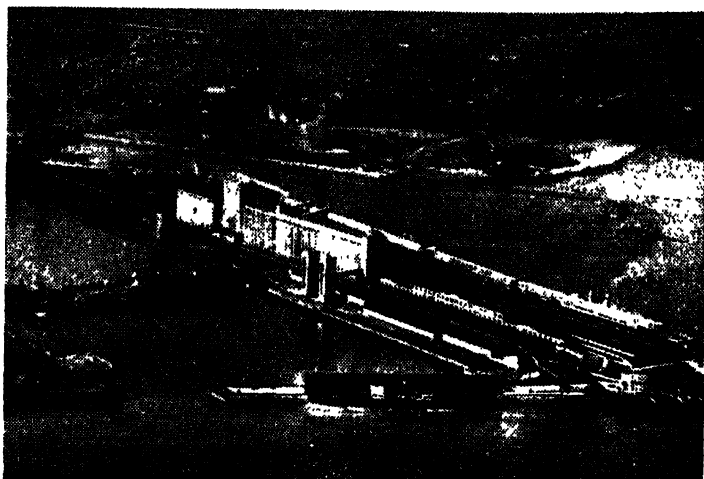


Alberta Government Photograph

RANCH LAND IN ALBERTA

forest management now firmly estab. as the national policy, the output of sawn lumber reached 7,305,958,000 ft board measure in 1953, in addition to a record cut of pulpwood. Most provs. now require timber operators on Crown lands to submit inventories of their cutting area and plans for managing and renewing the forest; and the Crown holds 93 per cent of C.'s forests. These forests stretch across the entire country, from the Maritimes to Brit. Columbia and the Yukon, covering 44 per cent of the land area, or 1,568,000 sq. m. The productive forest area is estimated at 828,000 sq. m., and the part of this which is accessible to transport and market is 582,000 sq. m. Of this 582,000 sq. m. is at present occupied. In addition there are 22,780,000 ac. of farm woodlots.

of the prairies), Deciduous (S. Ontario), Great Lakes-St Lawrence (area of the first great logging era; its rich stands of red and white pine are now cleaned out), and Acadia (Maritimes). The finest stands on the Brit. Columbia Coast will produce up to 100,000 ft board measure per ac., and big mills there can cut 500,000 ft board measure in a day. Of 150 tree species, only a score are commercially important, chief of these being spruce, with Douglas fir a close second, then hemlock cedar, white pine, jack pine, balsam, yellow birch, and maple. Forest protection services, despite great developments in fire-fighting equipment and aerial transport, still have to deal with many fires. In 1954 an estimated 81,000,000 cu. ft of standing merchantable timber was burned (as against a



Compagnie Aérienne Franco-Canadienne

QUEBEC: DOCKS AND GRAIN ELEVATORS AT THE MOUTH OF THE
ST. LAWRENCE RIVER



Paul Popper

VANCOUVER ISLAND: A LOGGING TRAIN

total cut that year of 3½ billion cu. ft.). Another type of protective operation is the spraying of large areas to combat the spruce budworm. In 1956 2 million ac. in N. New Brunswick was sprayed by 70 aircraft, operating from 12 airfields.

Research has developed rapidly in recent years on the growth and management of the forests and new uses for forest products. The list of the latter now includes tars, oils, chemicals, wood and ethyl alcohol, acetic acid, acetone, formaldehyde, vanillin, wood flour, wall boards, insulating boards, veneers and plywood, laminated beams, rayon, linoleum, imitation leather, cellophane, gramophone records, plastics, surgical dressings, yeast cakes, gun-cotton, and photographic film. The output of the forest industries now exceeds that of agriculture, and represents one-quarter of all Canadian manufs. Net value of production in 1953 was \$1,987,974,000. Just under half of the lumber cut in 1953 was exported, to a value of \$283,000,000. The pulp and paper industry ranks as the greatest single industry in C., in production and in wages paid. In 1954 its output reached a record \$1,241,558,451, over 4 times the 1940 value. Newsprint exports reached \$635,669,692, covering half of the world's needs.

Energy resources. There are few, if any, countries so blessed with energy resources as C. Cheap and abundant hydro-electric power has been the key to her rapid development in the 20th cent. Only Norway offers cheaper electric power. From 173,000 installed h.p. in 1900, hydro-electric capacity rose to 2,515,000 h.p. in 1920; 6,125,000 h.p. in 1930; 13,750,000 h.p. in 1950; and with projects under way will reach 23,550,000 h.p. in 1958. Large resources remain to be developed in Quebec, which already has half of C.'s hydro power; Labrador, where a huge potential on the Hamilton R. is being surveyed; Brit. Columbia, which is preparing to develop the Columbia and Fraser R.s.; and Manitoba, which will turn next to the Saskatchewan and the Nelson R.s. Other parts of the country, notably Ontario, are turning to steam stations to bridge the gap until atomic power becomes economical. C. has very large resources of coal, but in most cases of the wrong kind in the wrong place, such as the one-seventh of the world's bituminous coal in Alberta. Hard coal is found in the Crow's Nest Pass region of the Rockies and on the is. of Cape Breton. In Saskatchewan a steam power station is being erected on a surface coalfield which, it is estimated, will last for the life of the machinery; the coal is presently being mined for \$1 per ton. Meanwhile the Crown company Atomic Energy of C. Ltd is co-operating with Ontario Hydro-Electric Power Commission in building C.'s first experimental atomic power station, alongside the Des Joachim's hydro on the upper Ottawa R. The country has abundant uranium. Ontario Hydro estimates that its water power costs 0.35c. per kilowatt-hour, its steam power 0.70c., and

its first atomic power (in 1959) will cost 1.3c. Ontario power sells at an average of 0.80c. Quebec power, all hydro, sells at an average of 0.45c., but the aluminium industry pays only 0.21c.

CANADIAN TRADE, 1955

Exports to	\$ '000
United States	2,559,343
United Kingdom	769,313
Japan	90,893
W. Germany	90,751
Australia	58,482
S. Africa	56,026
Belgium and Luxembourg	53,384
Netherlands	47,689
Norway	47,031
France	42,563
Mexico	37,126
Venezuela	30,756
Italy	27,653
Switzerland	25,640
India	24,669
Imports from	\$ '000
United States	3,452,178
U.K.	400,531
Venezuela	187,277
W. Germany	55,603
Japan	36,718
India	35,147
Brazil	30,747
Netherlands W.I.	30,722
Belgium and Luxembourg	29,051
Mexico	28,814
Malaya and Singapore	28,810
Australia	26,295
France	25,016
Colombia	22,220
Netherlands	20,951

Foreign trade. C. is the fourth trading nation in the world, following the U.S.A., U.K., and W. Germany, which passed it in 1954, when it was also passed by New Zealand as the leading nation in *per capita* exports. C. does about 6 per cent of total world trade. The rise since pre-war has been spectacular, from just over \$1 billion in 1939 to over \$9 billions in 1955. The pattern of trade has also changed considerably. In the 1920's wheat was the leading export; in 1955 it was third, after newsprint and lumber. Wheat exports in that year amounted to only one-quarter of all forest products and less than half of all mineral exports. Leading exports in 1955, in millions of dollars, were newsprint 605, lumber 385, wheat 338, wood pulp 297, nickel 215, aluminium 210, copper 163, iron ore 99, asbestos 94, barley 76, flour 74, farm implements 72, zinc 70, whisky 60, fertilisers 56, fish 55, pulpwood 48, lead 37, petroleum 36, non-farm machinery 35. Imports continued to be dominated very heavily by manuf. goods and machinery, which amounted to 73 per cent of the total in 1955. Prin. imports, in millions of dollars, in 1955 were non-farm machinery 445, auto parts 246, petroleum

229, electrical apparatus 226, aircraft 138, steel products 129, tractors 115, engines 100, autos 83, fuel oil 77, coal 74, farm implements 62, raw cotton 61, chemicals 57, coffee 57.

A few features of C.'s trade in the 1950's was the development of a substantial unfavourable balance, reaching \$361,100,000 in 1955. This is ascribed to the heavy upswing in imports from the U.S.A., such as machinery for Canadian industrial development and appliances for Canadian homes, as well as expenditure by Canadian tourists in the U.S.A., which was greater than expenditure by Amer. tourists in C. The trade deficit has been more than compensated for by inflow of U.S. capital, around \$500 million per year since the Second World War. Total U.S. investment in C. exceeded \$10 billions in 1955, out of a total of \$14 billions of foreign investment. U.S. investors owned over half of all Canadian manufacturing plant, most of this in the form of wholly U.S.-owned subsidiaries which sell no stock to Canadians: 98 per cent of the automobile industry, 78 per cent of rubber, 70 per cent of non-ferrous smelting, 68 per cent of petroleum, 50 per cent of electrical manuf., 39 per cent of pulp and paper were U.S.-owned in 1953. This trend towards Amer. ownership of industry, and even more Amer. exploitation of oil and minerals, have combined with the influence of Amer. magazine, radio, and television advertising and Canadian travel in the U.S.A. to swing Canadian trade away from the U.K. towards the U.S.A. In 1898 imports from the U.S.A. first exceeded those from the U.K.; they have done so ever since, but as late as 1938 exports to the U.K. were greater than those to the U.S.A. The Second World War, and the ensuing inconvertibility of sterling, however, brought an overwhelming shift in C.'s trading pattern. She now buys (1955 figures) 73 per cent of her imports from the U.S.A. and only 9 per cent from the U.K.; sells 60 per cent of her exports to the U.S.A. and only 18 per cent to the U.K.

The 1932 Ottawa agreements providing a Commonwealth tariff preference, which supported trade with the U.K. during the depression years, have had a more permanent effect in increasing Canadian trade with other countries of the Commonwealth, which is now half as much as that with the U.K. Debate over the tariff has been a feature in Canadian political life ever since Macdonald introduced the 'national policy' in 1879, raising the average percentage of duty from 13 per cent to 20 per cent, as a protection for infant Canadian industry. Duties were lowered before the First World War and raised afterwards, reaching a peak of 32.9 per cent average *ad valorem* duty on total dutiable imports in 1933-4. This rate dropped, with the negotiation of the 1938 trade treaty with the U.S.A., to 24.3 per cent, then in 1947 to 20.8 per cent, and with the G.A.T.T. agreements to 17.1 per cent in 1950.

Such low tariff rates tend to favour the export of Canadian raw materials, but facilitate the import of manuf. goods into C. in competition with Canadian manufs.

Manufactures. The rapid development of industry during and since the Second World War has placed C. among the leading half-dozen industrial nations of the world. At the turn of the cent. a third of a million employees earned an average of \$333 each, turning out less than half a billion dollars' worth of goods. By 1920 600,000 employees were earning \$1200 each, turning out \$3.7 billions. There was but little advance during the next 2 decades, but by 1946 just over 1 million employees earned an average of \$1640 each, turning out a gross product of \$8 billions. In 1953 the number of employees in manufacturing had reached 1,327,451, their average earnings \$2981, and the gross value of production \$17,785,417,000. In terms of volume, the index of manufacturing (1935-9 = 100) was 189.9 in 1946 and 263.0 in 1953. This tremendous development may be attributed to rich resources of cheap electric power, great discoveries in minerals, of which the U.S.A. is running short, and vast forests; but also to stable gov., which provided a climate favourable to heavy capital investment, and eager adoption of the latest inventions and processes. It is not only mines, pulp mills, and aluminium smelters which have seen a vast development, but also the automobile, aviation, electronic, tool-making, and petro-chemical industries.

Pulp and paper remains the leading industry, with an output of newsprint 5 times greater than its next world competitor. In the 6 years 1948-53 over \$600,000,000 of new capital was invested in it. Its shipments were \$1,180,000,000 in 1953. Next was non-ferrous metal smelting and refining, with an output of \$871,000,000. Aluminium production exceeded 500,000 tons. Motor vehicles were third, up 333 per cent since 1946 to an output of 360,385 passenger cars. Automobile parts was in eleventh place and rubber manufacturing twelfth, both dependent on motor vehicles. The fourth industry was slaughtering and meat packing, and among other food industries butter and cheese was ninth, miscellaneous foods thirteenth, and bread and baking fourteenth. Petroleum products were fifth, and with development of W. oilfields and completion of pipelines to the E., the proportion of Canadian crude oil used by refineries rose to 46 per cent in 1953. Other industries, in order, sawmills; primary iron and steel, with capacity doubled 1946-53; aircraft and parts, at \$399,000,000; and railway rolling stock. All manufacturing contributed 3 times as much to the national income in 1953 as agriculture.

The leading industrial prov. is Ontario, with half of the total manufs., notably all of the motor vehicles and over 90 per cent of the heavy electrical machinery, farm implements, and machine tools. Ontario also has most of the rubber, steel, and radio-television industries. Quebec

follows with 30 per cent of C.'s industrial output, leading in pulp and paper, aluminium, asbestos, tobacco, and cotton production. Brit. Columbia is third, with sawmilling, pulp and paper, and fish processing, and a great new aluminium smelter at Kitimat (q.v.). The leading manufacturing centres are Montreal, Toronto, Hamilton, Windsor, Vancouver, Winnipeg, Sarnia, London, Kitchener, Edmonton, Quebec, and Calgary, in that order (1953).

Population and immigration. The pop. of C. is distributed across the S. part of the country, in the main within 200 m.

immigration has been of Brit. stock. After an almost complete stoppage of immigration for a decade and a half, 1,112,373 immigrants arrived in the 9 years following the Second World War. This falls far short, however, of the scale of immigration before the First World War when in the 7 years 1907-13 2,000,000 people arrived in C. Many of these people got off the trains on the prairies where there were neither stations nor tns nor farm buildings. They received free land and expected to create everything else with their hands. Now immigrants are carefully checked and



Canadian Pacific Railway

DOMINION SQUARE, MONTREAL

of the U.S. border. The prin. origins are British, French, German, Ukrainian, Scandinavian, Netherlands, Polish, Jewish, native Indian and Eskimo, Italian, and Asiatic, in that order. English is the general language of C., though in some parts of Quebec French is the only language understood. French is the language of Quebec and enjoys equal status with English in the federal parliament. The 60,000 French who lived in Quebec prov. at the time of the Brit. conquest in 1759 have proved one of the most fecund peoples in hist. In the 1951 census they numbered 4,309,326, and it is reckoned that a further 1½ million have emigrated to New England (where they have lost their language and much of their cultural attachment to the Fr. Canadian community). The part of the pop. of Brit. origin remains much the largest element, though it forms a steadily shrinking proportion of the total (see tables). Only one-third of the recent

medically tested overseas, brought in only in the most favourable season, and may be provided with food and shelter for a certain period while seeking work.

While immigration is one of the leading topics in Canadian public life, emigration has been a very large factor in holding down the growth of the pop. The dominion statistician has estimated that, in the period 1851-1941, while 6½ million people were coming into C., 6 million left for the U.S.A. The decade 1911-21, for example, showed a net loss of pop., some of the immigrants and the entire natural increase of a median pop. of 8 million having left the country. This period, however, is over. Pop. is now growing at a rate of 2½ per cent per year, which brought an increase of 2,000,000 in 1951-6. Chief factors in this are a steady immigration of about 150,000 per year, a 40 per cent increase in the birth rate from its low point of 20.5 in the depression to 28.7 in 1954, and a sharp

ORIGINS OF THE CANADIAN POPULATION

Distribution of the Population by Origin, 1881, 1911, and 1951

Origin	1881		1911		1951 ¹	
	No.	p.c.	No.	p.c.	No.	p.c.
British Isles	2,548,514	59.0	3,999,081	55.4	6,371,905	46.8
French	1,298,929	30.0	2,061,719	28.6	4,309,320	31.6
German	254,319	5.9	403,417	5.6	619,627	4.5
Italian	1,849	—	45,963	0.6	152,142	1.1
Jewish	667	—	76,199	1.1	181,456	1.3
Netherlands	30,412	0.7	55,961	0.8	264,091	1.9
Polish	—	—	33,652	0.5	219,766	1.6
Scandinavian	5,223	0.1	112,682	1.6	282,455	2.1
Ukrainian	—	—	75,432	1.0	395,023	2.9
Asiatic	4,383	0.1	43,213	0.6	72,315	0.5
Indian, Eskimo	108,547	2.5	105,611	1.5	164,480	1.2
Other	71,967	1.7	193,713	2.7	615,427	4.5
All Origins	4,324,810	100.0	7,206,643	100.0	13,648,013	100.0

¹ Excludes Newfoundland for comparison with previous census years; 93.5 per cent of Newfoundland's pop. were of Brit. Isles origins and 2.7 per cent of Fr. descent.

GROWTH OF POPULATION IN CANADA

Prov. or Ter.	1891	1901	1911	1921
Prince Edward Is.	109,078	103,259	93,728	88,615
Nova Scotia	450,396	459,574	492,338	523,837
New Brunswick	321,263	331,129	351,889	387,876
Quebec	1,488,535	1,648,898	2,005,776	2,360,510 ¹
Ontario	2,114,321	2,182,947	2,527,292	2,933,662
Manitoba	152,506	255,211	461,394	610,118
Saskatchewan	—	91,279	492,432	757,510
Alberta	—	73,022	374,295	588,454
Brit. Columbia	98,173	178,657	392,480	524,582
Yukon	—	27,219	8,512	4,157
NW. Ters. ²	98,967	20,129	6,507	8,143
Total	4,833,239	5,371,324	7,206,643	8,787,464
Prov. or Ter.	1931	1941	1951	1955
Newfoundland ³	—	—	361,416	412,000
Prince Edward Is.	88,035	95,047	98,429	108,000
Nova Scotia	512,846	577,962	642,584	683,000
New Brunswick	408,219	457,401	515,697	558,000
Quebec	2,874,662	3,331,882	4,055,681	4,520,000
Ontario	3,431,683	3,787,655	4,597,542	5,183,000
Manitoba	700,139	729,744	776,541	849,000
Saskatchewan	921,785	895,992	831,728	889,000
Alberta	731,605	796,169	939,501	1,066,000
Brit. Columbia	694,263	817,861	1,165,210	1,305,000
Yukon	4,230	4,914	9,096	10,000
NW. Ters. ³	9,316	12,028	16,004	18,000
Total	10,376,786	11,506,655	14,009,429	15,601,000

¹ Revised in accordance with the Labrador award of the Privy Council, 1 Mar. 1927.

² The decreases shown in the pop. of the NW. Ters. since 1891 are due to the separation therefrom of vast areas to form Alberta, Saskatchewan, and Yukon, and to extend the boundaries of Quebec, Ontario, and Manitoba.

³ The estimated pop. of Newfoundland (exclusive of Labrador) at 31 Dec. 1945 was 312,899; (including Labrador), 318,177.

slackening off in the outflow to the U.S.A. It is estimated some 250,000 Canadians, including some recent immigrants, went to the U.S.A. in the period 1945-55, while about 50,000 Canadians returned from the U.S.A., and as many Americans came to C. Most of the latter are posted on business and, while some remain many years, few take out Canadian citizenship.

The native Indians of C. still live in the main on reserves, as wards of the federal gov. While some go out into the stream of normal Canadian life, very few give up their special tax-free status and elect to take on the full duties and rights of citizenship. These numbered only 789 in the year 1954, out of a total Indian pop. of 151,558. The new Indian Act of 1951 has encouraged more Indians to build their own homes, repair the roads on the reservations, and increase their land under cultivation; 1853 Indians attended secondary schools, colleges, or special courses in 1954-5. The number of Eskimos is estimated at 9600; all live N. of the tree line and most of them on the N. coast or is. The decline in fur prices after the Second World War brought hardship to the Eskimos, but this was relieved by extending to them the family allowances of \$5-\$8 per child paid by the federal gov. to the rest of the pop. since 1945. More recently, many Eskimos have been employed in the building of the Arctic radar stations of the Distant Early Warning line (see DEW SYSTEM). They are good mechanics, and some are being trained to maintain the stations, operate motor transport, and service airfields.

Religion. Complete religious tolerance is observed in C. There is no estab. church for the whole country, although the Rom. Catholic Church is in effect the estab. church of Quebec. The proportion of the nation adhering to the Rom. Catholic faith has remained constant at about 40 per cent since Confederation, and in 1951 was 43.3 per cent. Second largest denomination is the United Church, formed in 1925 of a union of all the Methodists and Congregationalists and most of the Presbyterians, with 20.5 per cent. The Anglican Church of C. has 14.7 per cent; the Presbyterians 5.6 per cent; Baptists 3.7 per cent; Lutherans 3.2 per cent; Jewish 1.5 per cent; Gk Catholic, Gk Orthodox, Mennonite, and all others 7.5 per cent.

Education. Control of education falls under the provs. in the Canadian constitution, and the system is therefore quite diverse. There are, however, tax-supported public schools in all the provs., and in most provs. a prov. univ. Quebec has a dual system of public schools—Rom. Catholic and Protestant—and of the former there are both Fr.-speaking and Eng.-speaking institutions. Ontario has a public school system, mainly for non-Catholics, and separate schools for Rom. Catholics, in both languages. Manitoba closed its separate schools in 1890, but Saskatchewan and Alberta still maintain them. Newfoundland is unique in having public schools run by 6 different de-

nominations: Anglican, Pentecostal, Rom. Catholic, Salvation Army, Seventh Day Adventist (Mormon), and United Church. There has been much experimentation in secular school education, with a broad development of vocational schools, and even in Quebec the firm mould of the *collèges classiques* has been dented. These are private 8-year schools for boys, leading to a baccalaureate degree, and operated by Rom. Catholic communities. Many tax-supported, co-educational high schools are being opened up by the Quebec gov. to serve families which cannot afford private schools. Where before this generation secondary education in C. was regarded mainly as a preparation for univ., and was pursued by a small part of the elementary pupils, it is now taken by the great majority of young people. In Ontario, while the pop. was doubling during 1914-54 secondary school enrolment increased 5 times.

C. has 32 degree-granting univs., almost half of them being small institutions in the Atlantic provs. In 1955, 66,000 full-time students were enrolled, one-fifth of them being at the univ. of Toronto, largest in the Commonwealth. The percentage of college-age youth attending univ. (7½ per cent) is nearly twice as great as in the U.K., but still far below the U.S.A. (30 per cent). Most of the early Canadian univs. were founded by the Anglican Church, with strong Oxford or Cambridge influences: King's College, Windsor, Nova Scotia (1788); King's College, Fredericton, New Brunswick (1800); King's College, Toronto, Ontario (1828); Bishop's College, Lennoxville, Quebec (1843); Trinity College, Toronto (1852); Huron College, London, Ontario (1863); and St John's College, Winnipeg, Manitoba (1871). The Presbyterians founded Dalhousie, Halifax, Nova Scotia (1818); Queen's Univ., Kingston, Ontario (1841); and Manitoba College, Winnipeg, with univ. of Edinburgh influence. The Methodists founded Victoria Univ., Cobourg, Ontario (1836), now part of the univ. of Toronto; Mt Allison Univ., Sackville, New Brunswick (1858); and Wesley (now United) College, Winnipeg, Manitoba. The Baptists founded Queen's College (now Acadia Univ.), Wolfville, Nova Scotia (1838), and McMaster Univ., Toronto (1887), moved in 1930 to Hamilton, Ontario.

The beginnings of Rom. Catholic higher education go back to the founding of the *Collège des Jésuites*, Quebec (1635). Laval Univ. (charter 1852) grew out of the Grand Séminaire de Québec (1663), and the univ. of Montreal (charter 1920) from the branch of Laval Univ. estab. in Montreal in 1878. Both teach in French and are controlled by the Bishops of Quebec and Montreal respectively. The univ. of Ottawa (1849) is unique in being bilingual, while the tradition of the Rom. Catholic St Francis Xavier Univ. at Antigonish, Nova Scotia (1866), is highland Scots. St Michael's College (1852), federated in the univ. of Toronto;

Assumption College, Windsor, Ontario (1857), chartered in 1953; St Mary's College and Mt St Vincent College, Halifax, are Irish Catholic foundations. The first non-denominational private univ. in C. was McGill, Montreal (1821). The King's Colleges of Fredericton and Toronto were made non-denominational prov. univs., and prov. univs. have been estab. in Manitoba, Saskatchewan, Alberta, and Brit. Columbia. The last is now second largest in C. Other univs. are Carleton College, Ottawa, and W. Ontario, London. For all its diversity, Canadian higher education maintains a quite uniformly high standard. The National Research Council, estab. 1916 in Ottawa, has done a great deal to raise the level of research, in its own laboratories and by grants to the univs. The Royal Commission under Mr (later Governor-General) Massey recommended in 1951 the estab. of a C. Council to give similar support and encouragement to letters and the theatre. Many foreign students enrol in Canadian univs., principally McGill, Toronto, and the univ. of Brit. Columbia.

Banking and finance. The distinctive feature of banking in C. is the small number of banks (9) and the large number of their branch offices (4246 in 1955, an increase of 1000 in 10 years). Canadian banks have been notably sound in modern times, the last failure having been in 1933 and none occurring during the depression. The banks are privately owned (75 per cent of the shares being in Canadian hands) but operate on charters granted by Parliament, and subject to revision every 10 years. An inspector of the Ministry of Finance inspects the books at least once a year. The banks issued their own notes until 1935, when the Bank of C. took over this function. The latter, estab. as a bank of issue in 1934, was privately owned at first, and nationalised in 1938. The Bank of C. must maintain a gold reserve equal to 25 per cent of its note and deposit liability. The chartered banks are required to maintain a reserve by way of deposit with the Bank of C. Canadian currency was changed from a sterling to a dollar basis in 1853, and has coins of 5, 10, 25, and 50 cents, also the now rare silver dollar. Bills are 1, 2, 5, 10, 20, 50, and 100 dollars, up to a size of 50,000. The chartered banks extend much short-term credit to Canadian businesses and householders; their role is that of providing working capital rather than fixed capital. They have also a considerable business abroad, with 123 branches. Large and small personal loan companies are a mushroom and less pleasant growth of recent years. The 9 chartered banks, in order of size, with assets in 1955, are: Royal Bank, \$3,237,637,000; Bank of Montreal, first to be estab., in 1817, \$2,726,318,000; Canadian Bank of Commerce, \$2,281,098,000; Toronto-Dominion Bank, \$1,264,345,000; Bank of Nova Scotia, \$1,143,995,000; Imperial Bank, \$787,757,000; Banque Canadienne Nationale, \$609,482,000; Banque Provinciale,

\$246,350,000; and Mercantile Bank, \$12,450,000.

Public finance is in C. a divided and much disputed field. The British North America Act assigned to the provs. general control of, and financial responsibility for, education, justice, hospitals, and highways, while all financial matters of so designated fell to the dominion gov. The greatly increased outlays which modern life required in these 4 chief prov. fields, and, on the other hand, the rapid development of the income tax as the chief source of all public revenue, have combined to produce great strain in federal-prov. relations. The Rowell-Sirois Royal Commission (1937-40) sought to estab. a new basis for div. of tax powers and financial responsibility, but no final agreement on its proposals or any others has ever been secured. An emergency wartime agreement of 1942 provided for the vacation of the income tax, corporation tax, and succession duty fields by the provs. in return for 'rentals' paid to them by the federal gov. Ontario and Quebec refused to join in the renewal of this agreement in 1947, but in 1952 Ontario accepted most of the provisions. These payments now make up 30 per cent of the total receipts of the prov. govts. Most of the remainder they gather from taxes on gasoline, profit on liquor sales, licences on automobiles, and permits derived from natural resources.

Income tax is much the largest source of federal gov. revenue, collections being 17 times as great in 1955 as in 1939. In that year income tax, at \$142,000,000, was less than sales and excise taxes at \$161,000,000, and less than one-third of total revenue, \$502,000,000. The 1955 figures were: income tax, \$2,265,000,000; sales and excise taxes, \$824,000,000; and total revenue, \$4,123,513,300. For 8 consecutive years after the Second World War the federal gov. budgeted for a surplus, which it applied towards reducing the national debt from its peak of \$13,421,000,000 in 1946 to \$11,116,000,000 in 1954. Among the leading federal expenditures in 1955 were: national defence, \$1,665,000,000; family allowances, \$378,000,000; old age pensions, \$360,000,000; war veterans, \$240,000,000. The relative wealth of the provs. is indicated by these personal income tax collections for 1953: Ontario, \$535,000,000; Quebec, \$248,000,000; Brit. Columbia, \$126,000,000; Alberta, \$77,000,000; Manitoba, \$50,000,000; Saskatchewan, \$46,000,000; Nova Scotia, \$24,000,000; New Brunswick, \$16,000,000; Newfoundland, \$12,000,000; Prince Edward Is., \$1,620,000; and Yukon Ter., \$1,485,000.

Social services. There is as yet in C. no complete cradle-to-grave system of social security such as prevails, for example, in Great Britain. C. has been too recently a pioneer country, where everyone expected to take care of himself, for such a development. Nevertheless the ever-increasing complexity of modern industrial society has made itself felt here, as elsewhere. One has only to compare the public expenditure on welfare in 1913

(\$15,000,000) or 1937 (\$236,000,000), largely in relief payments to the unemployed or to distressed W. farmers, with the 1955 rate of \$1,000,000,000 a year. There is a system of family allowances, estab. in 1945, under which the federal gov. pays mothers (including new immigrants) an average of \$6 per child per month, which dispensed \$373,000,000 to 2,213,000 families in 1955. There is an old age pension scheme introduced in 1952, under which all persons aged 70 or over, who have been 20 years in C., receive \$40 per month. \$360,000,000 was dispensed in such pensions to 754,000 persons in 1955. In addition the federal and prov. govs. join in providing \$40 a month assistance to persons over 65 in needy circumstances. Needy blind persons over 18 receive up to \$40 a month, as do totally and permanently disabled civilians. War veterans are treated separately, and in 1955 some 160,000 veterans and 33,000 dependants received pensions. Allowances for needy mothers and their dependent children are provided by all provs., and Alberta has widows' pensions for women aged 60. Federal and prov. govs. join in providing unemployment assistance according to a variable scale. This is in addition to the contributory scheme of unemployment insurance.

A comprehensive national health service is one of the most discussed topics in the country, and was taken up at the federal-prov. conference of 1955. It would be contributory and would cover, in the first phase, hospitalisation for everyone, and in the second phase medical care and surgery. At present about 20 per cent of Canadians are covered by publicly operated hospitalisation plans, as in Saskatchewan, and another 40 per cent by private plans such as the Blue Cross. This latter service is available for a small monthly fee to most factory and office workers. It is estimated that the Canadian people now spend \$1 billion per year on health care.

Immunisation against communicable diseases is very far advanced in C., so that diphtheria, smallpox, typhus, tetanus, and whooping-cough have been virtually eliminated. In 1954 a nation-wide campaign against infantile paralysis was launched, through the Salk vaccine, provided free. There is a constantly growing effort in cancer research. The number of mental patients continues to increase, with an average of 60,111 in hospital in 1955; but the tuberculosis hospitals are no longer filled.

Defence. The traditional Canadian military force has been the militia, and it was typical that an officer of the militia and not of the permanent force, Gen. (later Sir Arthur) Currie, should have become commander of the Canadian Corps in France in 1917. There were 60,000 men in the militia at the outbreak of the Second World War, and only 4500 in the permanent force. With 5000 in the navy and 8000 in the air force, the total was 76,352, including 140 women. By 1943 the army had reached a peak strength of 481,500, the air force

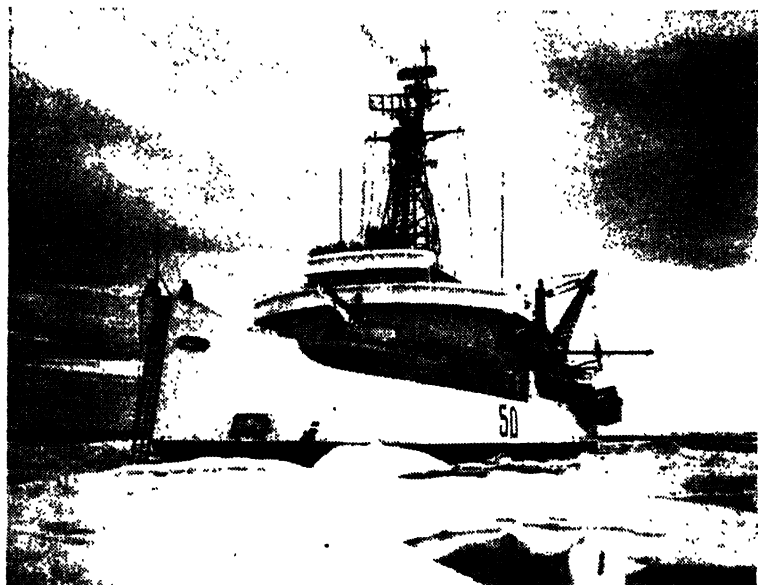
206,350, and the navy 75,354 (its peak was 92,880 in 1944). Over a million Canadians entered the forces during the war, including 50,000 women. One of the outstanding Canadian achievements was the operation of the Brit. Commonwealth Air Training Plan, which graduated 131,500 air crew, including 40,000 R.A.F., and 106,000 ground crew. The first Canadian troops to go into action were 2 battalions which arrived in Hong Kong just before the Jap. attack in Dec. 1941; 5000 Canadian soldiers participated in the Dieppe raid of Aug. 1942. Two divs. and an armoured brigade fought in Sicily and Italy, 1943-5, as a Canadian corps, with the Brit. 8th Army. Three further divs. and an armoured brigade formed the core of the First Canadian Army in the Normandy invasion, 1944. In early 1945 the Canadian troops in Italy were secretly moved to Holland, and the 2 parts of the army joined for the remainder of the war. This move arose quite as much from national feeling about Canadian troops fighting under non-Canadian command as from strategic reasons.

The Royal Canadian Air Force placed 48 squadrons in service overseas, including many heavy-bomber squadrons, and had thousands of its personnel attached to the R.A.F. The Royal Canadian Navy, expanding from a force of half a dozen destroyers and as many smaller ships to a fleet of 404 combat ships, including 254 corvettes and frigates, played an important role in escorting convoys across the N. Atlantic, fierce battleground of the U-boats. Altogether the Royal Canadian Navy convoyed 23,000 merchant ships, including the war's largest convoy of 167 ships. Some 10 per cent of the Canadian forces became casualties, or 103,000, although fortunately this was only half of the number in the First World War. 41,000 were killed, no fewer than 17,000 of these being from the Royal Canadian Air Force. On the material side the war cost C. an estimated \$15,000,000,000, two-thirds of this met by taxation, income tax receipts being increased by 11½ times during 1939-44. C.'s economic controls were, however, considered a model among the allied nations; living costs went up only 18 per cent during the war, as compared with 74 per cent in the First World War. Industrial production expanded enormously, so as to achieve a permanent change in the country's economy. Among the munitions produced were 16,000 aircraft, 6500 tanks and self-propelled guns, 391 cargo ships and 486 escort vessels, 244,000 machine guns, and 800,000 trucks and other motor vehicles.

After the end of the war demobilisation was swift. Much larger permanent forces have been maintained than before the war, but various plans for maintaining large and effective reserve forces have come to little. Since Korea the armed forces have been stabilised at around 100,000 men, something less than half being in the army. The air force

maintains 12 squadrons of jet fighters in Europe and 20 other squadrons of all kinds at home. The navy includes a cruiser and an aircraft-carrier, and is building 14 of the most modern type of destroyer-escort craft. The estab. of Canadian Arsenals Ltd. to keep gov. and private ordnance factories in a state of readiness, and the Defence Research Board, to develop new weapons, is an earnest that 'defence is here to stay.' In particular very large sums are being spent on the maintenance of a modern

of 1840, and the British North America Act, 1867. The first of these estab. the Fr. civil law throughout what then constituted the prov. of Quebec; the second divided the country into the Fr.-speaking prov. of Lower C., and the Eng.-speaking prov. of Upper C., and conceded representative gov. through an elective legislative assembly, but without executive control except in so far as it could refuse to vote taxes; the third reunited the 2 C.s under a single legislature and conceded the principle of responsible gov., the



Dept of National Defence, Canada
H.M.C.S. 'LABRADOR,' ARCTIC PATROL SHIP

aircraft industry in C., and on the building of radar warning lines across the middle and the N. of C. (Mid-C. and Distant Early Warning Lines).

Constitution and government. The constitution of C. is not an imitation of the constitution of the U.S.A., but is the Brit. constitution federalised. The many unwritten conventions of the Brit. constitution are also recognised in the Canadian constitution; the British North America Act, 1867, which defines the internal constitution of C. contains really a written delimitation of the respective powers of the dominion and prov. govts. Down to the time of the Confederation, C.'s constitutional development was based mainly upon 4 Acts of the Brit. Parliament: the Quebec Act of 1774, the Constitutional Act of 1791, the Act of Union

executive administration being from that time dependent on the legislature; the fourth separated the 2 C.s from their existing legislative union to make them provs., each controlling its own local affairs, in a wider confederation, which, within a short period so extended its boundaries as to embrace the whole of Brit. N. America. Until the end of the First World War C. really remained a colony. She had no representation of her own abroad, and all treaties were negotiated and signed for her by the Brit. Gov., which authority also appointed the Governor-General. Discontent with this situation had long been growing, and had been sharply stimulated by the Alaska boundary award of 1903. On this occasion the Brit. member of the tribunal sided with the 3 Americans

against the 2 Canadian members. So in 1909, when the Boundary Waters treaty, negotiated by Britain and the U.S.A., set up the International Joint Commission to deal with problems and disputes concerning the boundary waters of C. and the U.S.A., C. insisted on occupying all the seats on her side of the table. The first major development towards autonomy came after the First World War, when C. secured separate representation at the Versailles conference and membership of the League of Nations. At the same time she estab. a High Commissioner in London, and secured the consent of the U.K. to the attachment of a Canadian minister to the Brit. Embassy in Washington—though she did not carry this through, but waited to estab. a separate Canadian mission in 1927. Another milestone was C.'s negotiation of a treaty, for the first time, directly with the U.S.A., the Halibut Treaty of 1923.

A constitutional crisis arose in C. in 1926 over the imbroglio between the Governor-General, Baron Byng of Vimy, Mr. King, the Liberal leader, and Mr. Meighen, the Conservative leader. The Governor-General, acting, as most constitutional authorities have since agreed, quite properly, gave Mr. Meighen the chance to form a gov. when Mr. King no longer held a majority, and then granted to Mr. Meighen the dissolution which he had refused Mr. King. But Mr. King fought and won an election on the issue of ending C.'s 'Colonial' status. Out of the ensuing Imperial Conference of 1926 came the declaration, later formalised in the Statute of Westminster, 1931, stating that Great Britain and C. were 'autonomous communities within the British Empire, equal in status, in no way subordinate one to another in any respect of their domestic or external affairs, though united by a common allegiance to the Crown, and freely associated as members of the British Commonwealth of Nations.' One immediate consequence was that the Governor-General became the representative of the Crown in C., and not of the Brit. Gov.

This was autonomy at last. The following year a Canadian minister was sent to Washington, in 1928 a legation was opened in Paris, and in 1929 in Tokyo. After this there was no further extension of external relations, possibly for reasons of economy in view of the depression, until the outbreak of the Second World War. Offices were then opened throughout the Commonwealth and, so far as circumstances permitted, in many foreign countries. It should be mentioned also that C. allowed a full week to pass, in Sept. 1939, before declaring war on Germany, just to underline her independence. During the war Mr. King sharply vetoed the proposal made by Lord Halifax while on a visit to Toronto that the Commonwealth should estab. a permanent secretariat to pull it more closely together. After the war was over many further constitutional changes were carried through. In 1947 residents of C. became 'Canadian citizens'

as well as Brit. subjects; a Canadian woman marrying a non-Canadian could decide which citizenship she wished to hold. The Dominions Office of the Brit. Gov. was changed to the Commonwealth Relations Office, and C. was declared to be 'an overseas dominion of the King, in exactly the same position as Great Britain, the Metropolitan Dominion of His Majesty.' It was decided that there would be no further appeals from the Supreme Court of C. to the Privy Council in London. And the Governor-General was authorised to sign treaties and letters of credence for ambas. on the advice of the gov. of C. and without consulting the king. In 1949 the power to amend the Canadian constitution in matters lying solely within federal jurisdiction was transferred from the Brit. Parliament to the Canadian Parliament. And in 1952 a Canadian, Mr. Vincent Massey, was for the first time named governor-general. Only 1 major constitutional question remains unsettled: a means of amending the constitution in respect to prov. powers. And only 1 main attribute of sovereignty is lacking: a Canadian flag. The red ensign of the Brit. merchant marine, with the Canadian coat of arms in the fly, has served as what Mr. St. Laurent calls the 'distinctive' Canadian flag for 2 generations. A joint committee of the House and Senate approved this ensign, with a golden maple leaf in the fly, as the most acceptable flag design in 1946. But Quebec holds out for the *fleur de lis*, and opposes the union flag, and so C. remains without an official flag.

(i) *The dominion government.* The British North America Act declares that the executive gov. of C. shall continue to be vested in the sovereign of the U.K., represented for dominion purposes by the Governor-General, and, for prov. purposes, by the Lieutenant-Governor. The Governor-General is advised by the queen's Privy Council for C., a committee of which constitutes the ministry of the day. The dominion Parliament consists of the queen, the Senate, and the House of Commons. It must meet at least once a year, so that 12 months do not elapse between the last meeting in one session and the first meeting in the next. Senators, 102 in number, are appointed for life by the Governor-General under the great seal of C. The senatorial representation is as follows: Ontario, 24; Quebec, 24; Nova Scotia, 10; New Brunswick, 10; Prince Edward Is., 4; Manitoba, 6; Brit. Columbia, 6; Alberta, 6; Saskatchewan, 6; and Newfoundland, 6. They must be 30 years of age, Brit. subjects, residents of the prov. for which they are appointed, and possess £4000 over and above their liabilities. Members of the Lower House or House of Commons (who number 265) are elected by the people for the duration of the Parliament, which may not be longer than 5 years. They receive £10,000 a year.

The first dominion Parliament of 1867 consisted at its commencement of 181 members, 82 for Ontario, 65 for Quebec, 19 for Nova Scotia, and 15 for New

Brunswick. To this number were added, under the Manitoba Act of 1870, 4 members to represent the then newly created prov. of Manitoba; also, according to the agreement under which Brit. Columbia entered the Confederation, 6 were added to represent that prov., making 191 at the end of the first Parliament of C. In 1874, when Prince Edward Is. entered the Confederation, 6 members were added for that prov. In 1886 4 members were added to represent the NW. Tors. (2 for Assinibola and 1 each for the provisional dists. of Alberta and Saskatchewan), the total then being 215. There have since that time been many readjustments, required with every decennial census.

the Governor-General in council, and who governs with the advice and assistance of his ministry or executive council. The council is responsible to the legislature and resigns when it no longer has the confidence of that body. The legislatures have only 1 chamber, consisting of a legislative assembly elected by the people—except in Quebec, where there is also a legislative council. The legislature in each prov. may exclusively make laws in relation to the following matters: amendment of the constitution of the prov., except as regards the Lieutenant-Governor; direct taxation within the prov.; borrowing money on the credit of the prov.; public lands belonging to the prov.;



Canadian Air Board

OTTAWA: THE PARLIAMENT BUILDINGS

After the census of 1951 members were fixed at: Newfoundland, 7; Prince Edward Is., 4; Nova Scotia, 12; New Brunswick, 10; Quebec, 75; Ontario, 85; Manitoba, 14; Saskatchewan, 17; Alberta, 17; Brit. Columbia, 22; Yukon, 1; NW. Tors., 1; total 265. The only qualification necessary for the Commons is that the members must be 'Canadian citizens or British subjects,' and the same applies to the franchise. Voters must have been resident in C. for a year.

The dominion Parliament has exclusive legislative authority in all matters relating to the following: public debt and property; regulating of trade and commerce; taxation; loans on public credit; postal service; census; defence; navigation and shipping; lighthouses; quarantine; fisheries; ferries on frontiers; banking and issue of paper money; Indians, and lands reserved for Indians; naturalisation and aliens; and a number of other lesser topics. In short, it has exclusive legislative power in all matters except those specifically delegated by the constitution to the prov. legislatures.

(ii) *The provincial governments.* In each prov. the queen is represented by a Lieutenant-Governor, who is appointed by

prisons, hospitals, charities, etc.; municipal institutions; shop, saloon, etc., licences issued for revenue purposes; local works and undertakings other than inter-prov. or international communications; companies having prov. objects; property and civil rights within the prov.; administration of justice within the prov.; generally all matters of a merely local or private nature in the prov.

Dominion-provincial relations. The Canadian constitution was remarkably successful for a period of 50 years, while it was adapted to the conditions in C.; but, since then conditions have changed so markedly that the constitution is no longer suited to the age. For when the constitution was framed it was a compromise between those who wanted a strong federal authority and those who thought that it was essential to the success of confederation that Quebec should have control of all those matters in which that prov. differed (as indeed it still differs) from the others, and that consideration should be given to the fears of the remaining provs. lest they should lose their powers. Hence certain specified powers were assigned to the federal gov., certain other specified powers to the

provs., and all residuary powers were left to the federal gov. In this cent. the tendency has been to interpret the constitution in such a way as to strengthen the authority of the federal or central gov.; this being in accord with the movement of public opinion which, since the first decade, has been shifting the emphasis from liberty to power. Again, in 1864, when the constitution came into being, trade in C. was mainly local; to-day it is dominion wide. The power of the dominion gov. is no longer adequate for the effective control of trade and industrial activities, or for the carrying out of international agreements. Conversely,

between the financial powers and the obligations and functions of each governing body, and conduce to a more efficient, independent, and economical discharge of governmental responsibilities in C.

The commission's report was pub. in May 1940 and the ensuing federal-prov. conference to discuss the recommendations dispersed in violent disagreement. During the war C.'s problems grew in intensity and importance, and were met by a temporary agreement on the part of the provs. to 'rent' their portion of the income, corporation, and succession duty tax fields to the federal gov., in return for payments of so much per head of pop.



Ontario Dept of Travel and Publicity

ONTARIO PARLIAMENT BUILDINGS, TORONTO

the development of the social services, which appertain to the prov. authorities, has been so great that the financial provisions made for the provs. at the time of confederation have become quite inadequate. By the close of the inter-world-war period the need for a change in the relations between the central and prov. govts., especially in relation to the div. of taxing powers, was generally recognised. In 1937 the federal gov. appointed a commission, known as the Rowell-Sirois commission, to report on conditions and make recommendations. Its terms of reference were to make 'a re-examination of the economic and financial basis of confederation and of the distribution of legislative powers in the light of the economic and social developments of the last 70 years,' and 'to express what, in their opinion, subject to the retention of the distribution of legislative powers essential to a proper carrying out of the federal system in harmony with national needs and the promotion of national unity, will best effect a balanced relationship

As soon as the war was over efforts were renewed to reach a broader and more lasting agreement on reallocation of taxing powers. One of the chief claims raised by the federal gov. for a larger share of taxation was its plan to institute a national health service and old age pensions on a uniform national basis. (It had already introduced unemployment insurance in 1942, by agreement with the provs., although legislation which had been put through by the Bennett gov. during the depression to do this had been declared *ultra vires* by the courts.) Dominion-prov. discussions continued, with increasing acrimony, until they broke down in May 1946. The federal gov. then proceeded to sign separate agreements with the various provs.; naturally the neediest signed first while the wealthiest, Ontario and Quebec, who considered they had the most to lose, refused to go along with the others. In 1950 the Supreme Court ruled that the federal and prov. govts. could not legally exchange their legislative powers.

Another problem which became intensified during this period was that of a trans-C. highway, which the federal gov. wished to subsidize in order to bring it to completion and assure a national standard. Highways, however, come within prov. jurisdiction, and Quebec has steadfastly refused to co-operate in this national project. In 1952 the federal-prov. agreements of 1947 were renewed, and Ontario joined in, leaving the Quebec premier, Maurice Duplessis, to carry on alone the battle against '*les centralisateurs*' of Ottawa.

It has been a most interesting characteristic of Canadian politics in recent years that, voting federally, the people returned the Liberal gov., which had been in office with only a five-year break from 1921-57, until the success of Mr Diefenbaker and the Progressive Conservatives at the polls, while voting provincially they had elected gov. opposed to the Liberals. This is strikingly true in the most economically important provs. Quebec has a *Union Nationale* gov., Ontario a Conservative gov., Brit. Columbia and Alberta have Social Credit gov., and Saskatchewan a Co-operative Commonwealth Federation (nominally socialist) gov. Of the small provs., New Brunswick has a Conservative gov. and the others Liberal gov.

History. John Cabot had reached the shores of C. in 1497, but in 1534 Jacques Cartier, a Frenchman, undertook a voyage of discovery along the coasts of Newfoundland and Labrador, and on his second voyage (1536-7) discovered the St Lawrence R. and travelled as far as the Indian cap., Hochelaga. Some small settlements were made by the French, but abandoned after 2 years, and it was not till 1608 that Samuel de Champlain, who had visited the country in 1603 and subsequent years, founded the city of Quebec. The St Lawrence region formed a Fr. colony under the name of C. for the next cent. and a half, but the Eng. Hudson's Bay Co. was formed in 1670, and began to carry on trade with the Indians in the NW. Ter. Halifax in Nova Scotia was founded in 1749, and a Brit. governor was set over a number of British who had emigrated thither. The struggle between the French and the English for the possession of the N. Amer. continent was lengthy and determined, but the momentous struggle with the French came to a victorious end with the battle of the Heights of Abraham, in which both the Eng. General Wolfe and the Fr. General Montcalm were killed. By the treaty of Paris of 1763, C. and the disputed lands between the Ohio and Mississippi passed into the hands of the British. The Fr. colonists were allowed to sell their property and return to France if they wished, but above all they were granted complete freedom of worship, and on the whole C. remained satisfied. During the Amer. war the Fr. colonists remained loyal, owing principally to the fact that the Quebec Act of 1774 confirmed their right of worship in their old Catholic faith, and they were also allowed to hold land

according to the system of anc. France. Thus pacified, they gave no help to the rebels, and rather regarded the possible inclusion of C. with the revolting colonies as a misfortune which was to be avoided at all costs. The settlement of what is now the prov. of New Brunswick took place about this time as a result of the driving of the loyalists from America (U.S.A.). The colonists, loyal though they were, however, insisted upon a recognition of their constitutional rights, and they demanded self-gov. in local affairs. This they were granted by the Constitutional Act of 1791, which divided C. into an upper and a lower prov., both of which had a representative assembly.

During the war of 1812-14 both provs. remained loyal and helped to repel the invasions of the Americans. The boundary between C. and the U.S.A. was first defined by another treaty of Paris in 1783 at the end of the Amer. War of Independence. But after the war of 1812 we find a state of affairs which boded ill for the mother country. The colonists were discontented and aggressive; their discontent showed itself in the rebellions of Papineau and Mackenzie, both of which were futile. But the opening of the reign of Queen Victoria did not give prospect of an immediate relief of the situation. Bloodshed and discontent were rife; something must be done which would help in the settlement of C. Lord Durham, who was sent out to investigate matters, suggested that the colony should be granted responsible gov., and a legislative union of Upper and Lower C. took place. The Fr. party for some considerable time held the balance of power, and the rioting at Montreal in 1849 led to the removal of the legislature, first to Toronto and Quebec alternately, and finally to Ottawa. For some time there was a considerable movement in favour of union with the U.S.A., but a reciprocity treaty with U.S.A. in 1854 put an end to this movement. After many difficulties and many deadlocks between the great political parties, the British North America Act was passed by the Brit. Parliament in 1867, and the dominion of C., consisting of Upper and Lower C., New Brunswick, and Nova Scotia, came into being. Prince Edward Is. and Newfoundland dropped out of the scheme at the last moment. There were many reasons for this federation, the chief perhaps being that the fear of Amer. aggression made the colonists feel that united action would safeguard the interests of them all. The new additions were of great value to the colonists of Upper and Lower C., and the federation went far to establish a really strong Brit. dominion in N. America. After the confederation, the Canadian Gov. obtained in 1879 the right to give a preference in tariffs to another colony (or dominion), in 1881 the right of representation when treaties concerning her interests are being discussed, and in 1897 the right to demand that a treaty which she considers inimical to her interests shall be abrogated. In the meantime occurred 2 rebellions of the half-breeds

led by Riel, one in 1869 and the other in 1885; the second was the more dangerous, but was put down, and Riel was executed. Again, since the confederation, in face of many difficulties, the dominion has gone on incorporating new provs. and stretching her boundaries to the N. and to the W. The Hudson Bay ter. was incorporated. Brit. Columbia joined the dominion, and step by step the whole of the present ter. of the dominion was incorporated.

Between the years 1881 and 1885, in spite of opposition and in the face of the greatest difficulties, the Canadian Pacific Railway was built, and amongst the names which stand out above all others at this time are to be remembered those of Lord Strathcona, Lord Mount Stephen, and Sir John Macdonald. The latter, after leading the Conservative party in C. successfully for many years, *d.* in 1891. He had faced many critical movements, but he had been true to his policy of faith in C. and the Brit. Empire. His death broke up the Conservative party, and in 1896 Sir Wilfrid Laurier and the Liberals were returned to power. They remained in office until 1911, when their policy of reciprocity was defeated and the Conservatives under Mr (later Sir Robert) Borden were returned. C. sent a contingent to the S. African war, and in the First World War landed its first contingent in Britain on 16 Oct. 1914. Canadian troops fought in the second battle of Ypres, at St Julien, Festubert, Vimy Ridge, Hill 70, Passchendaele, the Somme, and Cambrai (q.v.), among other engagements. During the period of the war the Houses of Parliament at Ottawa were destroyed by fire (Feb. 1916), and there was a disastrous explosion of munitions at Halifax, N. Nova Scotia (Dec. 1917). In the year following the war, the Prince of Wales made an official tour of C., opening Quebec Bridge on 22 Aug. and laying the foundation-stone of the tower of the new Parliament buildings at Ottawa. In the same year the Canadian National Railways were organised. Sir Robert Borden was succeeded by Mr Arthur Meighen as Premier in 1920, but his Conservative ministry soon fell, and Mr W. L. Mackenzie King, Liberal, became Premier (Dec. 1921), and held office till 1926, during which period there were 2 Imperial Conferences (1923, 1926) at which he represented C.; a trade agreement was signed between C. and the Brit. W. Indies (1925), and Baron Byng of Vimy (q.v.) was made Governor-General, 1921. In 1926 Mr Meighen once again became Premier, but was defeated in the House immediately and resigned. The taxation issue and that of protective tariffs remained the dominant note in Canadian politics, neither party having any very clear advantage in majority, but in 1930 Mr King was severely defeated at the general elections; Mr (later Lord) Bennett (q.v.) became Prime Minister at a time of somewhat serious unemployment and was pledged to an upward revision of tariffs, to exclude, especially, imports of manufs. from the U.S.A. In Oct. 1930 Mr Bennett came to London at the head of

the Canadian delegation to the Imperial Conference, the prin. issues being economic and constitutional (inter-imperial relations).

C. suffered with other countries in the world economic crisis which began in 1929. Factories closed, the wheat market collapsed, and the demand for manuf. and agric. products fell to disastrous levels. The prairie farmers were especially hard hit and the wheat pools faced great losses. The prov. govts. came to their aid and by 1932 they were operating again as co-operative elevator companies. After the depression a drought set in, bringing 8 years of successive crop failures, while soil erosion aggravated the loss, high winds blowing the scorched and crumbled earth for great distances. By 1933 thousands of farmers were on relief, their savings wiped out, and innumerable farms were abandoned. The year 1930 marked the end of the era of the rise of the wheat empire, which had begun with the construction of the railways, and though grain must continue to be important, the W. had other resources awaiting development. It was in this year, too, that the natural resources, which hitherto had been kept under the control of the dominion gov., were transferred to the provs. The depression also ended new political movements. In the Social Credit party (q.v., and also ALBERTA) advocated drastic changes in the control of banking and money and gained control of the prov. legislature. The Co-operative Commonwealth Federation, organised in 1933, advocated a wide extension of public ownership and a great extension of the social services. Despite the depressing features of the economic crisis these years were not devoid of substantial achievements: the Prairie Farm Rehabilitation Act of 1935, passed by the Conservative Gov., provided for a programme of research through the co-operation of dominion and prov. govts. Through the efforts of farmers and scientists, the line of agriculture was extended gradually further N. in Saskatchewan and Alberta. Radio and flying, too, helped in the expansion northward, freight being carried through the NW. Ters. and even to the Arctic Is. McMurray, at the end of the railway, 300 m. N. of Edmonton, became the gateway to the Mackenzie, and from there the airline reached N. 1600 m. to Aklavik on the Arctic shore; but the full effects of this expansion northward have not yet been realised. The overwhelming Liberal victory in the prov. elections of 1934 was followed by Mr Bennett's heavy defeat in the general election of 1935, when Mr Mackenzie King once more became Premier. Lord Willingdon succeeded Baron Byng as Governor-General in 1926 and was himself succeeded by Lord Bessborough in 1931. In 1935 Lord Tweedsmuir (John Buchan) became Governor-General, one of the most popular in the country's hist. This was also the period of constitutional development in C., as in the other dominions affected by the Statute of

Westminster passed in 1931 (q.v.). In the case of C., and at the express wish of the Canadian Gov., 2 limitations with regard to the British North America Act, that is, with regard to the Canadian constitution, remained despite the Statute: (a) amendments were still to be made by the Brit. Parliament, which, however, would act only at the request of the Canadian Gov.; (b) legal cases involving the interpretation of the British North America Act could still be taken on appeal to the judicial committee of the Privy Council as the highest court of the empire. These limitations were to be removed whenever C. wished, and were retained because no method of amending the constitution had been found which was approved by all the provs. As the Statute of Westminster, by repeating the principle of the Crown as the symbol of the free association of members of the Brit. Commonwealth, demonstrated that the Crown was the only legal link binding the members together, it was as King of C. that George VI made his royal tour in 1939 and addressed the Canadian Parliament in Ottawa. In this transformation from Empire to Commonwealth C. has always played a leading part.

The royal tour of King George and Queen Elizabeth in N. America in 1939 was a striking sign of the new spirit of understanding among the nations of the Brit. Commonwealth and between Britain and the U.S.A. This better understanding, however, did not manifest itself so much in common policies as in the tacit recognition of common interests which in the long run went deeper. On 10 Sept. 1939 the Canadian Parliament resolved that the king should declare a state of war between C. and Germany. A landmark in Canadian hist. was the creation on 18 Aug. 1940, by C. and the U.S.A., of the Permanent Joint Board of Defence, through an agreement signed at Ogdensburg by Mr Mackenzie King and President Roosevelt. By this agreement the signatories in effect declared their determination to co-operate fully 'in the defence of the northern half of the Western Hemisphere.' The Ogdensburg agreement marked a new stage not only in the relations of C. and the U.S.A., but in the relations of the U.S.A. with the Brit. Commonwealth. For the first time in her hist. the U.S.A. had signed a permanent military agreement with a member of the Commonwealth, and had recognised C. as her closest friend and associate. For the first time, too, C. had shown that she was bound to join with her neighbour in defence of the common continent while she was free also to stand by other Brit. nations overseas.

Early in 1946 public confidence in Russian integrity was shaken by the 'Soviet spy case.' The gov. appointed Justices Taschereau and Kellock of the Supreme Court as royal commissioners to investigate the evidence brought out by the Soviet Embassy by a cipher clerk, Igor Gouzenko, of the extent of Soviet spying in C. The most prominent of those exposed were Fred Rose, Communist

M.P. for Montreal-Cartier; Sam Carr, organiser of the Communist party; Dr Raymond Boyer of McGill Univ.; and the Brit. atomic scientist, Allan Nunn May. They were convicted of passing atomic secrets to the Soviets (see *Report of the Royal Commission*, 27 July 1946, Queen's Printer, Ottawa). The warning contained in the Gouzenko case no doubt helped to make C. one of the leaders in proposing the N. Atlantic Alliance in 1947. The threatening Soviet attitude, which led to the blockade of Berlin (June 1948), stimulated the Atlantic nations to press on with this project, and C. joined the other 11 signatories of the N. Atlantic Treaty in Washington, 4 April 1949. A domestic event of great importance occurred at the same time, Newfoundland joining the Canadian confederation on 31 Mar. 1949. Achieved at the time by only a small majority in a referendum (see NEWFOUNDLAND), this step led to a considerable improvement in the economic welfare of the former colony, and is now widely approved by the Newfoundland pop.

The 2 events, the one foreign and the other domestic, launched the remarkable political career of Louis S. St Laurent as Prime Minister of C. Mr Mackenzie King (q.v.) had retired in Nov. 1948 after holding office for a total of 23 years since 1921, thus achieving his ambition of surpassing Walpole's term. His successor, a Quebec lawyer who had never been in politics until persuaded in Dec. 1941 to fill the place of the deceased Ernest Lapointe as Minister of Justice and leader of the Quebec wing of the Liberal party, proceeded in 1949 to win the greatest electoral victory in Canadian hist. Mr King had won an overall majority in June 1945, with 125 Liberal seats against 68 Conservative, 29 Co-operative Commonwealth Federation, 13 Social Credit, and 1 Communist, out of a house of 245. Mr St Laurent won a landslide election in June 1949: 193 Liberal to 41 Conservative, 13 Co-operative Commonwealth Federation, and 10 Social Credit, out of a house of 265. The Korean war of the following year had a great impact on C., which had fairly promptly supported the U.N. effort by sending an army brigade, 3 destroyers, and an air transport squadron, all of which it maintained in the field throughout the war. The hostilities in Korea brought a sharp increase in Canadian defence spending, reversing the post-war trend towards lower budgets and reduced taxes. An ambitious and expensive aircraft production programme was launched, to produce 2 types of jet fighter and the Orenda engine. Many of these fighters were given to the European members of N.A.T.O. as mutual aid; and the maintenance of 12 fighter squadrons in Europe, along with a brigade of troops, became C.'s chief contribution to N.A.T.O. Nevertheless the Korean war gave a further spur to C.'s industrial and mineral development, which began at this time to gather real momentum.

Despite a fresh round of inflation the country was so prosperous that in 1953 the St. Laurent gov. achieved another great electoral sweep. This long-sustained Liberal popularity was strained somewhat by the acrimonious debate of 1955 over the gas pipeline from Alberta to the E. industrial areas. Conservatives and Socialists (C.C.F.) joined for once in opposing the plan of the Minister of Trade and Commerce, Mr. Howe, to loan money to U.S. interests to build the line, and called for a publicly owned project. In 1957, following a general election, the St. Laurent gov. was defeated, and J. G. Diefenbaker (q.v.), leader of the Progressive Conservative party, was appointed Prime Minister. Final results showed that the Progressive Conservatives held 110 seats in the new parliament, Liberals 105, Commonwealth Co-operative Federation (C.C.F.) 25, Social Credit 19, Independents 2, Independent Liberal 1, Liberal-Labour 1, Independent Progressive Conservative 1, and there is 1 vacancy, making a full complement of 265 seats.

Art. Art in C. began in the colony of New France about 1670 when the sojourning artist, Frère Luc (Claude François), transplanted the European style of religious painting into C. Shortly afterwards sculpture in wood was introduced by Jacques Leblond de Latour and other carvers who came as masters to Bishop Laval's school of arts and crafts near Quebec. Though painting was for a cent. to remain in the thrall of folk art or the imitation of Europe, the carving of statues and of decorative work in churches developed freely, reflecting but not imitating the Fr. style in its unfolding from the Louis XIV to the Louis XVI. The Levasseur family in Quebec were the prin. exponents of this art during the era of relative isolation from France in the earlier 18th cent. The art of embroidery flourished under the nuns and often showed considerable originality.

The Brit. conquest of 1759 restored contacts with Europe to a limited extent. A reflection of Chardin and Fragonard is seen in François Beaucourt, the first Canadian painter to study abroad. Later, in the first half of the 19th cent., the portraits of Antoine Plamondon and Théophile Hamel combined the simplicity of folk art with the influence of the Fr. classicists. The Brit. tradition by this time had also begun to play its important part in the formation of Canadian art. In Nova Scotia Robert Field carried the methods of 18th-cent. Brit. portraiture into the early 19th cent. In Quebec the carvers of the Baillairgé *atelier* and the silversmiths combined Eng. neo-classic motifs with their traditional Baroque elements to produce an original and splendid style.

Landscape painting was, however, the most important legacy of Brit. art. A considerable number of topographical artists visited the colony and recorded the Canadian scene. The best of them was Thomas Davies, whose sense of pattern,

colour, and the mystery of the wilderness is only equalled by Rousseau le Douanier. These inspired resident artists such as Paul Kane (1810-71), whose study of the landscape and Indian life took him from Toronto to the W. coast and back again between 1846 and 1848. Cornelius Krieghoff (1815-72), who was in C. between 1840 and 1866, painted the Fr. Canadian scene in the picturesque manner of Düsseldorf, but he also recognised the broad patterns and bold colours which belong to the Canadian landscape. Robert Whale (1805-87) painted landscapes in the manner of Wilson, often including such interesting details as early railway trains and bridges.

About 1870 the romantic picturesqueness of Kane and Krieghoff gave way to a naturalistic treatment of the Canadian scene. This is evident in the landscapes of John A. Fraser, Allan Edson, Henry Sandham, and Lucius O'Brien, and in the realistic *genre* and portraits of Robert Harris (1849-1919), painter of the first Canadian mural picture, 'The Fathers of Confederation,' in 1881. This movement coincided with the founding of the first official art organisations, the Royal Canadian Academy and the National Gallery of C. (1880). In the nineties realism yielded to a richer, more poetic mode which is apparent in the work of Horatio Walker (1858-1938), the painter of *habitant genre*, who was the most extreme exponent of the Barbizon style; Homer Watson (1855-1936), a landscape painter, the directness of whose early style was later swamped by his imitation of Constable; and Wm Brynmor (1855-1925), the painter of dream-like landscapes with a kinship to Inness in the U.S.A. Realistic sculpture, as practised by Hamilton MacCarthy, also gave way to the elegance of monuments of Louis-Philippe Hébert (1850-1917).

A younger generation of painters who saw in Fr. impressionism a new approach to the Canadian landscape played an important part in launching the modern Canadian school. Maurice Cullen (1866-1934) painted atmospheric scenes of Quebec and Montreal; in his later landscapes he eliminated the European haze of atmosphere in order to express the emphatic contours and colour patterns of the N. landscape. James Wilson Morrice (1865-1924), who lived most of his life in Paris in contact with all movements from Whistler to Matisse, had the immediate effect in his native country of encouraging the flat pattern and the further-reaching one of establishing the idea of 'pure' painting.

But the first movement in Canadian art which is to be identified as 'national' was begun by a group of painters in Toronto in the years following 1910. A. Y. Jackson brought from Montreal the influence of Morrice as well as his own passion for discovery. The untrained Tom Thomson (1877-1917) contributed a native understanding of the N. woods; Arthur Lismer and Franklin Carmichael (1890-1945) had a feeling for rhythmic movement; F. H. Varley, a mastery of paint; J. E. H.

MacDonald (1873-1932), a poetry of interpretation; Lawren Harris, a dynamic vision of the forces of nature. The Group of Seven (including the foregoing with the exception of Thomson, and with the addition of sev. others at different times between 1920 and 1933) felt the impact of impressionism, *Art Nouveau*, and Scandinavian expressionism, but national feeling was paramount and fused these influences into a new style, austere, unquiet, and uncompromisingly regional, which was hailed in Europe during the twenties before it was accepted at home. Contemporaries of the group in other parts of C. included Albert Robinson and Clarence Gagnon. Two other artists of the same generation developed individual styles of a high order. David Milne's (1882-1953) delicate, imaginative, quiet manner depends on patterns of a simple and exquisite sort, and elusive colour harmonies as personal as handwriting. Emily Carr (1871-1945), who painted all her life in Brit. Columbia, underwent an astonishing expressionist development after brief contact with the Group of Seven. Her canvases and spontaneous large 'sketches' in oil on paper are expressions of her enthusiastic response to the stylised forms of the Indian totems and her excited reaction to the luxuriant growth of the W. forests.

Recent trends include a further development of the style of the Group of Seven along broader and more varied and personal lines on the part of one important group. L. L. FitzGerald (1890-1956), with his linear definition of Winnipeg backyards, Charles Comfort with his simplified landscapes of the thirties, Carl Schaefer with his subtlety and intimacy in water-colour, Wm Ogilvie with his delicate, stylised figures, Jack Nichols with his delicate and pathetic ones, and Edwin Holgate, with his powerful ones, all stem from the 'austere' school. A number of *genre* painters have moved somewhat away from this sphere of influence, yet are bound to it by their attachment to the Canadian scene: these include Henri Masson, André Biéler, and Pegi Nicol MacLeod. Some, including Jean-Paul Lemieux, Edward J. Hughes, and Alexander Colville, approach the simplicity and intensity of the folk artist. Jack Humphrey, Marian Scott, and Fritz Brantner are inspired by abstract movements in France, England, and Germany respectively. Jean Dallaire and Kenneth Lockhead are surrealists. A Montreal group which has grown up since 1939 looks to Morrice and to John Lyman as the patron saints of non-particular art and has been deeply influenced by contemporary European schools of 'pure' painting, abstraction, and expressionism, particularly the school of Paris. It includes among others Goodridge Roberts, Stanley Cosgrove, Alfred Pellan, and Jacques de Tonnancour; also Paul Émile Borduas (leader of the *Automatistes*) and his pupil, Jean Paul Riopelle, the internationally famous *tachiste*.

New schools of painting have recently

appeared in 2 cities. Vancouver has seen the greatest development and the greatest variety of styles, including the decorative abstractions of B. C. Binning and the 'animist' compositions of J. L. Shadbolt and Gordon Smith. A new Toronto group, 'Painters Eleven,' includes the vigorous non-figurative painters, Wm Ronald and Harold Town.

Sculpture has followed the same general pattern of development as painting. Perhaps the only significant influence between 1900 and 1940 was the dubious one of *Art Nouveau* (Walter Allward: *Vimy Memorial*, 1924). The animal and landscape reliefs of Emmanuel Hahn and Elizabeth Wyn Wood paralleled the work of the Group of Seven in painting. The influence of European monumental sculptors like Mestrovic and Milles was the inspiration of sev. sculptors like Suzor-Côté, Frances Loring, et al. Louis Archambault, whose 'Iron Bird' caused a sensation in 1950, stands out among younger sculptors.

Some of the most recent endeavours of Canadian artists have been in the realm of the film (Norman McLaren) and industrial design. Art societies, which have grown greatly in numbers and effectiveness during the past 25 years, have played an important part in the stimulation of Canadian art. The work of the National Gallery of C., which for many years has carried on a nation-wide programme of travelling exhibitions, is now supplemented by a growing number of museums, galleries, and community centres.

Architecture. See CANADIAN ARCHITECTURE.

Literature. See CANADIAN LITERATURE and FRENCH CANADIAN LITERATURE.

Bibliography. TRAVEL AND SOCIAL CONDITIONS, ETC.: Sir A. Mackenzie, *Voyage from Montreal through the Continent of North America*, 1801; Anna Jameson, *Winter Studies and Summer Rambles in Canada*, 1838; A. Henry the Elder, *Travels and Adventures in Canada and the Indian Territories*, 1901; R. B. Deane, *Mounted Police Life in Canada*, 1916; J. Nelson, *The Canadian Provinces: their Problems and Policies*, 1924; F. O. Call, *The Spell of French Canada*, 1928, and *The Spell of Acadia*, 1930; A. P. Wollcott, *Mackenzie and his Voyageurs*, 1927; R. England, *The Central European Immigrant in Canada*, 1929; G. M. MacInnes, *In the Shadow of the Rockies*, 1930; H. A. Innis, *Fur Trade in Canada*, 1930; H. Strang, *Pioneers in Canada*, 1934; J. H. Stemberge, *Portrait of Canada*, 1944; M. MacDonald, *Canadian North*, 1945; W. A. Griesbach, *I Remember*, 1946; H. Griffin, *Alaska and the Canadian North-west*, 1947; F. S. Smythe, *Rocky Mountains*, 1948. HISTORY: A. G. Bradley, *The Fight with France for North America*, 1902; A. Shortt and A. G. Doughty, *Canada and its Provinces* (22 vols.), 1913-14; G. C. West, *The North-west Company*, 1918; O. D. Skelton, *Life and Letters of Wilfrid Laurier*, 1921; W. R. M. Kennedy, *The Conquest of Canada*, 1922; F. Waldo, *Down the Mackenzie through the Great Lone Land*,

- 1923; J. H. E. Secretan, *Canada's Great Highway*, 1924; R. G. Trotter, *Canadian Federation: its Origin and Achievements*, 1924; G. M. Wrong, *A Canadian Manor and its Seigneurs: the Story of a Hundred Years, 1761-1861*, 1927, *The Rise and Fall of New France*, 1928, and *Canada and the American Revolution: the Disruption of the First British Empire*, 1935; C. Wittke, *History of Canada*, 1928; Dollier and de Casson, *A History of Montreal, 1640-72*, 1928; Sir R. L. Borden, *Canada in the Commonwealth: from Conflict to Co-operation*, 1929; C. Martin, *Empire and Commonwealth: Studies in Governance and Self-Government in Canada*, 1929; W. C. New, *Lord Durham: a Biography of John George Lambton, first Earl of Durham*, 1929; F. Niven, *Canada West*, 1929; *Cambridge History of the British Empire* (vol. vi, *Canada and Newfoundland*, 1930); W. Doughty, *Under the Lily and the Rose*, 1931; W. Rosa Langstone, *Responsible Government in Canada*, 1934; E. C. Guillet, *Lives and Times of the Patriote (the 1837 Rebellion)*, 1938; B. K. Sandwell, *Canada*, 1941; G. W. Brown, *Building the Canadian Nation*, 1942; A. L. Burt, *A Short History of Canada for Americans*, 1942; E. W. McInnis, *The Unguarded Frontier (a hist. of Canadian-Am. relations)*, 1942; C. P. Stacey, *The Canadian Army, 1939-45*, 1948; Margaret McWilliams, *This New Canada*, 1949; J. Bruchesi, *A History of Canada* (Fr. and Eng. ed.), 1950; Keenleyside and Brown, *Canada and the United States* (from colonial times to the present), 1952; B. Hutchison, *The Struggle for the Border*, 1955. CONSTITUTIONAL HISTORY AND DOCUMENTS: Sir C. P. Lucas, *A History of Canada, 1763-1812* (a standard work, the facts in which are founded on the works of Shortt and Doughty and of Egerton and Grant), 1909; R. McGregor Dawson (ed.), *Constitutional Issues in Canada, 1900-31* (sources comprise official documents, newspapers, and periodicals), 1933; R. McGregor Dawson, *Development of Dominion Status, 1900-36*, 1937, and *Development of Democratic Government in Canada, 1949*; W. P. M. Kennedy, *The Constitution of Canada, 1834-1937. An Introduction to its Development, Law, and Custom* (the standard work on the Canadian Constitution and in effect the political hist. of the dominion), 1938; E. Forsey, *Dissolution of Parliament* (on the constitutional crisis of 1926), 1943; P. Gérin-Lajoie, *Constitutional Amendment in Canada*, 1950; N. Ward, *The Canadian House of Commons*, 1950. COLONISATION AND SETTLEMENT: The 9 vols. of the series 'Canadian Frontiers of Settlement,' ed. by W. A. Mackintosh and W. L. G. Joerg, pub. in C., 1934-40, are a monumental reference work covering all aspects of prairie or frontier settlement. (Among the vols. are A. S. Morton, *History of Prairie Settlement*; W. A. Mackintosh, *Economic Problems of the Prairie Provinces*; C. A. Dawson, *Group Settlement: Ethnic Communities in Western Canada and Pioneering in the Prairie Provinces: the Social Side of the Settlement Process.*) J. B. Hedges, *Building the Canadian West* (land and colonisation policies of the Canadian Pacific Railway), 1939. POLITICAL-ECONOMIC: R. A. MacKay and E. B. Rodgers, *Canada Looks Abroad* (a detailed objective survey of the whole field of Canadian external relationships and policy), 1938; C. Martin (ed.), *Canada in Peace and War: Eight Studies in National Trends since 1914* (political and economic development of C. in the previous 3 decades), 1941; F. H. Soward and others, *Canada in World Affairs: the Pre-War Years* (survey of international relationships of C.), 1943; G. W. Brown (ed.), *Canada*, 1950. FRENCH CANADIANS: A. Siegfried, *Le Canada: Les Deux Races* (penetrating interpretation of C.'s racial problem as between the French and the English as it presented itself 4 decades ago), 1906; Mason Wadco, *The French Canadians*, 1953. HUDSON'S BAY COMPANY: B. Willson, *The Great Company (1667-1871)*, 1900; H. A. Innis, *The Fur Trade in Canada: an Introduction to Canadian Economic History* (an interpretation of the historical record of a primary industry), 1930. BIOGRAPHY: D. Campbell, C. Scott, P. Edgar, and W. D. le Sueur (editors), *The Makers of Canada* (originally pub. in 1906 in 20 vols.; revised ed. in 12 vols., ed. by W. L. Grant, pub. in 1926; vol. xii is the *Oxford Encyclopedia of Canadian History*, ed. by L. J. Burpee); W. S. Wallace (compiler), *The Dictionary of Canadian Biography*, 1927; D. Creighton, *John A. MacDonald*, 1955; see also Sir John Willson, *Sir Wilfrid Laurier and the Liberal Party*, 1903; G. M. Wrong, *Life of Lord Elgin*, 1905; B. Hutchison, *Mackenzie King*, 1953. ART: F. B. Housser, *A Canadian Art Movement: the Story of the Group of Seven*, 1926; R. Traquair, *The Old Silver of Quebec*, 1940; G. Morisset, *Coup d'œil sur les arts en Nouvelle-France*, 1941; D. W. Buchanan, *Canadian Painters*, 1945, and *The Growth of Canadian Painting*, 1950; Art Gallery of Toronto, *The Development of Painting in Canada*, 1945; G. C. McInnes, *A Short History of Canadian Art*, 1950; P. Duval, *Canadian Drawings and Prints*, 1952, and *Canadian Water Colour Painting*, 1954; R. H. Hubbard, 'A Period of Growth in Canadian Art,' in *The Culture of Contemporary Canada*, 1957, and *Canadian Works of Art in the National Gallery of Canada*, 1947; see also *Canadian Art* (a quarterly periodical). **Canada Balsam**, see ADHESIVES. **Canada Goose**, *Bernicla canadensis*, species of the Anatidae or duck family which is common to N. America. It is a wild goose which sometimes breeds in Europe, and it is closely related to the Barnacle Goose (q.v.). **Canadian Architecture**. Architecture in Canada had its beginnings in the first dwellings built by Fr. settlers on the St Lawrence in the 17th cent. Unlike the wooden houses of New England, those in Canada were built of stone. At the outset they resembled buildings in Normandy, but during the 18th cent. there appeared certain native features, the most noticeable

of which was an upward tilt of the eaves. In only a few buildings of the Fr. regime, designed by clerical amateurs or Fr. military architects, were there traces of the classicism of Paris; otherwise churches, religious houses, and dwellings alike shared a common simplicity of design.

The 18th-cent. Eng. settlements in the Maritime provs. followed a version of the Georgian similar to that found in New England, and Eng. influences mingled with local traditions in Fr. Canada after 1759. The end of the 18th cent. and the earlier 19th cent. saw the introduction of the log cabin on the frontier, but in architecture reflected the Regency styles, with the Palladian being the favourite for larger buildings (Province House, Halifax, by John Merrick, 1811). Many buildings of this period show evidence of the austere, handsome work of Scottish stonemasons. The architects of this time were often Eng. military engineers (Quebec Anglican cathedral by Maj. Robe and Capt. Hall, 1804), but during the first half of the 19th cent. the Gk revival (q.v.) spread into Canada from the U.S.A.

The Gothic revival (q.v.) began with Notre-Dame in Montreal, designed in 1824 by James O'Donnell with Gothic details and Georgian proportions, and an elaborate carpenter's Gothic sprang up at the same time. But later architects such as Wm Thomas (St Paul's, Hamilton, 1857) based their work on a closer study of Gothic monuments, while Frank Willis approached true medieval proportions in the cathedrals of Fredericton (1845) and Montreal (1857). The most imposing monuments of the revival were Univ. College, Toronto (by F. W. Cumberland, 1856), built in the Norman style which was then considered a variety of Gothic, and the Parliament Buildings at Ottawa, which show Ruskin's influence (1859 ff.; the central block, destroyed by fire in 1916, by Thomas Fuller, and the surviving E. and W. blocks by Frederick Stent). In the sixties and seventies the Renaissance style was also revived, particularly for office buildings. The influences until this time were predominantly British, but in the eighties the sturdy, sombre Richardsonian Romanesque from the U.S.A. (see RICHARDSON, HENRY HOBSON) had a considerable effect in Canada, though it was often modified by the addition of features which lent a Scottish baronial air to office buildings, parliaments, etc. (cf. Ontario Legislature, Toronto, by R. A. Waite, 1890).

At the turn of the century the naïveté of earlier decades was replaced by a studied correctness of design. The architects, who about 1900 founded their professional schools and societies, became conversant with a variety of styles, applying their Renaissance to office and legislative buildings (Saskatchewan Parliament, Regina, E. & W. S. Maxwell, 1910), their learned Gothic to churches and parliament buildings (new central block, Ottawa, John A. Pearson, 1919), their Classic to banks and railway stations (Union Station, Toronto, 1919, Ross &

MacDonald, Hugh Jones, and J. M. Lyle), their Georgian and Tudor to villas, and the now familiar Fr. 'château' style to hotels—as site or function seemed to demand. They found a new idea in the 'château' style which was intended to give an old Fr. air to such buildings as railway hotels (Château Laurier, Ottawa, by D. R. MacFarlane, 1910).

Skyscrapers—the *Daily Star* Building, Toronto (Chapman & Oxley, 1928); the Aldred Building, Montreal (Barott & Blackader, 1930); and the Canadian Bank of Commerce, Toronto (Darling & Pearson, 1930) are among the largest examples—which depended on structural steel and reinforced concrete, sometimes had the exterior of a cathedral or palace.

The first evidences of a new style, which frankly acknowledged the new materials and techniques and expressed new functions, appeared early in the present century in utilitarian structures such as factories and grain elevators. But the development of contemporary architecture has been made difficult by the continuing 'battle of the styles.' This is seen to good advantage in Ottawa, where the forces of conservatism have kept official architecture in bondage to the 'château' style; but non-official buildings have offered a challenge in the form of steel-and-glass structures like the Commonwealth Building (Alra & Balharrie, 1954). The newer movements are better able to make their way in the central and W. cities. John B. Parkin Associates in Toronto, and Green, Blankstein, Russell & Associates of Winnipeg (new National Gallery design, 1954), are among the leaders. But in Vancouver the architect seems to have the greatest freedom. Firms such as Sharp & Thompson, Borwick Pratt (Grauer Hydro-electric Station, 1953, with colour design by the painter B. C. Binning), and Semmens & Simpson (St Anselm's Church, etc.) are leaders in this vigorous movement. Vancouver's recent competition for a civic auditorium was, however, won with a striking design by a group of Montreal architects (Guy Desbarats and others). See R. Traquair, *The Old Architecture of Quebec*, 1947; G. Morisset, *L'Architecture en Nouvelle-France*, 1949; A. Gowans, *Church Architecture in New France*, 1955.

Canadian Literature (English). Canada has produced little that would rank as great literature, and Canadians are first to admit this. But the time has passed when either Canadians or Britons would say that the country had no distinctive culture of its own. Desmond Pacey, in one of the most recent studies of Canadian literature, claims it 'has a distinctive conception of man's lot on the earth, a conception engendered by the peculiar features of the Canadian terrain. . . . In it man is dwarfed by an immensely powerful physical environment which is at once forbidding and fascinating.'

Canadian culture had its beginnings in Halifax, Nova Scotia, a prov. which became British some 40 years before the rest of Canada. Henry Alline (1748-84), an immigrant from New England, may

be said to have been the first Canadian writer. His *Life and Journals* have been compared to the works of Bunyan. The first book-length poem was written by a Canadian-born Oliver Goldsmith who was a descendant of the Brit. Oliver Goldsmith, its title, *The Rising Village*, being reminiscent of *The Deserted Village*. Similarly, the first Canadian novelist, Thomas Haliburton (1796-1865), was a distant relative of Sir Walter Scott. His Sam Slick of *The Clockmaker* is still a memorable character, and was perhaps the model of Dickens's Sam Weller, as his squire might have suggested Pickwick.

The central figure in Canadian colonial literature was Joseph Howe (1804-73), who was also Nova Scotia's leading politician in his day. An early poet, then an outstanding journalist, he left a number of books of travel sketches, including *Western Rambles*, 1828, and *Eastern Rambles*, 1830; as well as his *Letters to Lord John Russell* and his *Collected Poems and Essays*.

Among the Loyalists, who came to Canada after the Amer. Revolution, there were many educated people who played the main role in founding the early univs. of Canada. The chief record of their experience is the *Journal* of Jacob Bailey (1731-1808); their leading poet was Jonathan Odell (1737-1818). Writers of the colonial period in Upper and Lower Canada (Ontario and Quebec) include the Scots Immigrant Alex. McLachlan (1818-1896) with his *Young Canada, or Jack's as Good as his Master*, and the first part of a projected epic, *The Emigrant*, very much in the Burns style. An account of pioneer life which is still read is that of Susanna Moodie (1803-85), *Roughing It in the Bush*. A more far-ranging account of life in Canada during this same period, recently reprinted, is that of Mrs Anna Jameson, a visiting Irishwoman, an altogether remarkable person, *Winter Studies and Summer Rambles in Canada*, 1838.

The leading poet of this era was John Richardson (1796-1852), whose long narrative poem, *Tecumseh*, on the war of 1812, and novel, *Wacousta*, have remained in print for over a century. Richardson is also of some note as the first talented Canadian writer to starve to death, not for lack of trying but for lack of an adequate book market in Canada: the relatively small pop. of the country is divided between 2 main language groups, a large part of its people came to Canada as barely literate peasants, and Brit. and Amer. pubs. have always dominated the market. Charles Sangster (1822-93) might have succeeded to Richardson's dubious honour, but avoided starvation by working in the post office for the last 25 years of his life. His pub. poems are *The St. Lawrence and the Saguenay*, *Hesperus*, and *Our Norland*. Charles Healey (1816-76) produced the only outstanding Canadian drama, *Saul*.

In the latter part of the 19th cent. there were more and more works by native-born and univ. educ. Canadians, although brilliant newcomers like Goldwin Smith of Toronto often dominated the scene. The

literary jour., *The Week*, which he and Charles G. D. Roberts ed. in 1883-96, provided the best opportunity for pub. which new Canadian writers had enjoyed up to that time. Canada's best poets stem from this period: Roberts himself (1860-1943), later knighted; Charles Mair (1838-1927); Archibald Lampman (1861-1899); Duncan Campbell Scott (1862-1947); Bliss Carman (1861-1929), perhaps the best-known of all Canadian poets; Wilfred Campbell (1861-1918); and W. H. Drummond (1854-1907), who wrote charming poems of the Fr. inhab. On the distaff side there was Isabella Crawford (1850-87), whose work, when pub. by J. W. Garvin, brought recognition only after her death; and Pauline Johnson, a full-blooded Iroquois princess, whose patriotic verse was widely read.

The outstanding novels of the 19th cent. were historical: Wm Kirby's *The Golden Dog*, 1877, and Gilbert Parker's *The Seats of the Mighty*, 1896. The former must be ranked as one of the finest pieces of Canadian writing. A number of novels of Fr. Canada, written in this period by Eng.-speaking authors anxious to help explain the older branch of the Canadian nation to the younger one, deserve mention. They include T. G. Marquis's *Marguerite de Roberval*, 1899, a story of the times of Jacques Cartier; W. D. Lighthall's *The Young Seigneur*, 1888; and Agnes Laut's *Lords of the North*, 1900, and *Heralds of Empire*, 1902, which deal with the early fur traders and explorers of the W.

Novelists of the early 20th cent. include sev. who, varying the usual Canadian story, enjoyed great success through large sales of their novels abroad. 'Ralph Connor' (the Rev. Charles W. Gordon) sold five million copies of his *Black Rock*, 1897, *The Sky Pilot*, 1898, *The Man From Glengarry*, 1901, and other novels, read to-day only for their historical interest. Arthur Stringer made a long and successful career in the U.S., but used Canadian material in his books (*Lonely O'Malley*, 1901, *Prairie Wife*, *Prairie Mother*, and *Prairie Child*, 1916-21). L. M. Montgomery enjoyed a huge success with her *Anne of Green Gables* series; as did Marshall Saunders with *Beautiful Joe*. Marian Keith's *Gentleman Adventurer* is an excellent historical novel of the Riel Rebellion. Three others whose works are still known around the world are Robert W. Service, with his *Songs of a Sourdough* and other sagas of the Yukon Gold Rush; Mazo de la Roche with her *Jalna* series, which has run into a score of vols.; and Stephen Leacock, the beloved humorist and sage of *Sunshine Sketches of a Little Town* and many other works. Quite different is the story of Canada's leading realistic novelist, Frederick Philip Grove, a well-educ. and travelled Anglo-Swede who seemed to love Canada more passionately as he became embittered with Canadians as readers. His *Over Prairie Trails*, 1922, *The Turn of the Year*, 1923, *Settlers of the Marsh*, 1925, and *Our Daily Bread*, 1928, somewhat in the style of Knut Hamsun, have been called the

truest accounts of life on the Canadian prairies and the most powerful novels in Canadian literature. The other outstanding Canadian realist of the period was also of Scandinavian (Icelandic) extraction: Laura Salverson, who wrote *The Viking Heart*, 1923. Nellie McClung's stories of pioneer days in the W., such as *Sowing Seeds in Danny*, are of a much milder nature. Poetesses of this period were Marjorie Pickthall and Audrey Alexandra Brown; poets, John McCall, *In Flanders Fields*, and Wilson Macdonald, *Out of the Wilderness*.

Among the best-known Canadian writers of recent years are F. E. D. McDowell, *The Champlain Road*, 1939, and Philip Child, *The Village of Souls*, 1933, both novels set in the 17th cent. There are also Will Bird, *Here Stays Good Yorkshire*, 1945; Thomas H. Raddall, *Pride's Fancy*, 1946; Kathleen Coburn, *The Grandmothers*, 1949; and Ethel Wilson, *The Innocent Traveller*, 1949. Morley Callaghan, *They Shall Inherit the Earth*, 1935, and others; Hugh MacLennan, *Two Solitudes*, 1945; Gabrielle Roy, *The Tin Flute*, 1948; Roger Lemelin, *The Town Below*, 1948; and Germaine Guevremont, *The Outlander*, 1950, are leading contemporary novelists. Another novel, set in Soviet Russia but written in Canada and much noticed around the world, is Igor Gouzenko's *The Fall of the Titan*, 1954. The most important contemporary poet is E. J. Pratt; others are Earle Birney, A. M. Klein, L. A. Mackay, Dorothy Livesay, Anne Marriott, and James Wreford.

See also FRENCH CANADIAN LITERATURE. See A. McMechan, *The Headwaters of Canadian Literature*, 1925; L. Pierce, *An Outline of Canadian Literature*, 1927; V. B. Rhodenizer, *A Handbook of Canadian Literature*, 1930; Logan and French, *Highways of Canadian Literature*, 1932; E. K. Brown, *On Canadian Poetry*, 1945; A. J. M. Smith (ed.), *The Book of Canadian Poetry*, 1948; Desmond Pacey, *Creative Writing in Canada*, 1952; and A. Phelps's essays on a number of *Canadian Writers*, 1952.

Canadian Mounted Police, see ROYAL CANADIAN MOUNTED POLICE.

Canadian Railways. Railways in Canada have always represented something more than mere transportation. In essence, they have represented nation-building. The early projects, such as the Grand Trunk, the Intercolonial, and the Canadian Pacific, now seem to have been ambitious beyond young Canada's strength; but they were undertaken in furious competition with the extension of canals and railways on the Amer. side of the border, in a determination to hold the N. half of the continent for Brit. settlement. The first railway in Canada was a 15-m. line between Laprairie, opposite Montreal, and St John's, at the head of Lake Champlain, in 1836. The first big project was the St Lawrence and Atlantic, which linked Montreal with Portland, Maine, as a winter port. With the 1850's came the first great railway building boom, the Grand Trunk being

pushed through from Montreal to Sarnia, Ontario (and later to Chicago), the lines of the Great Western spreading out from the Toronto-Niagara area, and the N. railroad running from Toronto up to Collingwood, on the Georgian Bay. This latter line formed a link between Lakes Ontario and Huron, and handled much trade for Chicago. It is estimated that \$100 millions were poured into railway building in Canada in the 1850's.

Confederation brought the compact to build the long-discussed Inter-Colonial Rail Road, along the S. shore of the St Lawrence, from Montreal to Halifax, linking the Maritimes with what was then called 'Canada.' It was completed in 1876. Partly strategic (it was launched at the time of the Amer. Civil War) and partly political, it failed then to give Halifax the traffic it expected; but it has fully justified itself in 2 world wars. The 1870's and '80's were dominated by the great project of a railway to the Pacific. This too had been part of a political compact, promised to bring Brit. Columbia into the union. With 1000 m. of rocky wasteland in N. Ontario, 1000 m. of empty prairie beyond Winnipeg, and then the mighty Rockies, it was a formidable project. The infant Canadian nation of 4 million was setting out to do what the powerful U.S.A. of 40 million had just achieved, in completing the Union Pacific Rail Road in 1869. Canada's decision, or at least John A. Macdonald's decision, was made in 1871. But in 1873 Macdonald's gov. was turned out of office through the 'Pacific scandal,' by which the chief financier of the new railway was shown to have heavily supported Macdonald's successful election campaign of 1872. The next gov. was an exceedingly honest and cautious one, and advanced the railway scheme very little. It took Macdonald's return to power in 1878 to fire the boiler; a new syndicate of Montreal financiers was formed, led by George Stephen (later Lord Mount Stephen), Donald Smith (later Lord Strathcona and Mount Royal), and R. B. Angus, with the energetic American, Wm. Van Horne (later Sir Wm), as president, and the steel was laid to the Pacific by 1885. The Canadian Pacific Railway (C.P.R.) then set out to bring in settlers for the 25,000,000 choice ac. it had received from the gov., and the colonisation of the W. was under way. As this proceeded, the promoters of the Canadian Northern Rail Road, Mackenzie and Mann, began to string their grain-collecting roads across the prairies, feeding into the C.P.R. for the E. haul. As the development fever mounted, the Grand Trunk Rail Road plunged into a project for an extension to the Pacific. The logical development would have been amalgamation with the Canadian Northern Rail Road. But the Liberal gov. of Laurier, irritated for many years by Conservative boasts that they had built the C.P.R., galled as much by C.P.R. support for the Conservative party, and anxious to counter the vast power wielded by the C.P.R., came out with a scheme for a National Transcontinental

Rail Road. This was to take a more northerly route across Ontario, the prairies, and Brit. Columbia, with its Pacific terminus at Prince Rupert. The gov. would build the E. section, the Grand Trunk Pacific (G.T.P.) the W., and the G.T.P. would operate the line. (This is almost exactly the formula advanced by a Liberal gov. in 1956, for building the Trans-Canada Pipeline.) This second transcontinental line, which in its long section across N. Ontario was already one too many, was no sooner under construction than the Canadian Northern started to build a third. When the First World War suddenly checked the colonisation of the country, it was soon discovered that the railways had been over-built. In 1922 the bankrupt Canadian Northern and G.T.P. were reorganised and amalgamated into the nationally owned Canadian National Railways (C.N.R.) at a great loss to many Brit. and Canadian investors. Its first president, Sir Henry Thornton, made every effort to weld the C.N.R. into a real system and to build up its morale until it could compete with the C.P.R. (which also had a notable president in that era, Sir Edward Beatty). The C.P.R. has never relished a situation in which its competitor's losses are covered from the public treasury; but it had vast subsidies itself from the gov. in the beginning, and undoubtedly the country's interest is better served through the 2 railway systems, rather than 1 privately-owned leviathan. It was for the latter reason that the proposal for amalgamation of the railways, urged by the C.P.R. on a Royal Commission in 1931, was turned down.

The C.N.R., with 23,763 m. of track, is now the greatest railway system of N. America. It includes the Quebec Bridge (central span, 1800 ft), next to Sydney Bridge the longest in the Commonwealth. The C.P.R. has 17,153 m. of track, and with subsidiary steamship lines and air-lines is the greatest travel system in the world. These 2 railways jointly operate the N. Alberta, running up to the Athabasca and Peace R.s, with 923 m. of road; and on main E. Canada runs they operate 'pool' trains over each other's tracks. The C.N.R. operates the Hudson's Bay Rail Road, completed in 1931, to the port of Churchill. It has also taken over operation of the 700 m. of railway in Newfoundland, much of which is narrow gauge. The only other considerable railways in Canada are provincially owned, the Northern Ontario, running from N. Bay to Moosonee on James Bay; and the Pacific Great Eastern in Brit. Columbia. The latter is now being linked for the first time with Vancouver at its S. end, and extended N. to the Peace R. country. The first extensive railway-building period in a quarter cent. has lately pushed steel into a number of new mining areas. A 360-m. line has been built from Seven Is. on the N. shore of the Gulf of St Lawrence to open up rich iron ore deposits in the heart of Ungava. Another new line in Quebec runs to Chibougamau, lines in Ontario to Geco

and Manitouwadge, in Manitoba to Lynn Lake, and in Brit. Columbia from Terrace to the great new aluminium smelter at Kitimat. Under discussion is a 500-m. railway from the Peace R. northward to Pine Point on Great Slave Lake, where one of the richest lead and zinc deposits in the world has been discovered. All freight and passenger rates, and many other matters concerning the railways, come under the jurisdiction of the Transport Commission. U.S.A. railways operate 863 m. of line in Canada. C.R. are being rapidly dieselised and re-equipped with the most modern coaches. See H. A. Innis, *History of the Canadian Pacific Railway*, 1923, and d'A. C. Coleman, *Mount Stephen and the C.P.R.*, 1945.

Canadian Sea, see HUDSON BAY.

Canakkale, seaport and il of the same name in Asiatic Turkey, on the Dardanelles. The allied fleet attacked it in 1915, but without success. In 1922 it was occupied by Brit. forces in order to arrest the advance of Kemal's army. This nearly resulted in war with Turkey—or the resumption of war, for as yet peace had not been officially concluded—but the contretemps was avoided by the tact of Sir Charles Harington, the Brit. Commander-in-Chief in the Black Sea area. Pop. (il) 312,679, (tn) 11,633 (1950).

Canal (Lat. *canalis*, a channel), artificial water-course serving the purpose of drainage or irrigation, or more frequently for the transportation of merchandise in boats, barges, or ships. C.s have undoubtedly been in existence since very early times. Herodotus and Strabo both speak of a C. across the isthmus of Suez which was begun in 616 bc by Necho and completed by the year 521 bc. In Egypt the Nile has from time immemorial been noted for its irrigation C.s; traces of waterways which the anc. Egyptians constructed still remain. The Imperial or Grand C. of China is of great antiquity; it commences at Hang-chau, near the mouth of the Yangtsiang R., and crossing the Yangtsiang at Chinkiang terminates at Tientsin. The total length is about 650 m., but the depth is seldom more than 6 ft. C.s were probably first built for irrigation, but, especially after the invention of locks, they acquired importance for navigation. A lock chamber enclosed by a pair of gates was said to have been constructed by 2 brothers, Domenico in 1481, and Leonardo da Vinci 6 years afterwards completed 6 locks which united the C.s of Milan. A C. can rarely be built on one level and usually consists of a series of level reaches at varying heights above a datum line; each reach is closed by locks. The bases of the hills and the winding of the valleys must provide the general route for these reaches. The channel of the C. has a flat bottom and sides which slope outwards from the bottom. In dists. where the soil cannot withstand the erosion of the water, the sides should be lined with 'puddle,' a compound of tempered clay mixed with water, which is worked into the sides to a distance of 2 or 3 ft. Sometimes the sides are faced with stonework or concrete

where there is much traffic. The breadth of the C. bottom should be at least twice the greatest breadth of the boat using the C.; the depth of the water should be at least $1\frac{1}{2}$ times the draught of the boat; and the area of the waterway should be 6 times the greatest midship section of the boat. The width of an ordinary inland C. in this country is 25–30 ft at the bottom, and 40–50 ft at the level of the water. The depth is about 4–5 ft. To maintain the level of water in a C., it may be necessary to provide storage in a reservoir; surplus water may be discharged over waste weirs to lay dry a portion of the C. for carrying out repairs. Stop-gates are necessary at short intervals.

Locks are chambers made of wood, brickwork, etc., and provided with gates at each end. The lock is of sufficient size to take the largest vessels which use the C.; it is placed at the termination of the lower reach, and rises to a slightly greater height than that of the water in the upper reach. The gates of the lock, which are very strongly made, open against the direction of the current, and are slightly more than half the width of the lock chamber, so that they meet before they form a straight line, and are kept firmly in place by the pressure of the water. Sluices are placed in each gate near the bottom, and can be worked from the top of the lock independently of the gates themselves. When a boat is about to ascend from a lower to a higher reach of the C., the upper gates and sluices, commanding the flow from the upper reach, are closed. The sluices at the lower end of the lock are opened, and when the level of the water in the lock chamber is the same as that of the lower reach, the boat enters the lock. The lower gates and sluices are then closed, whilst the sluices only in the upper gate are opened. The water in the lock then gradually rises until it reaches the level of the upper reach, when the upper gates can be opened and the boat passes out of the lock into the higher reach. When a boat descends from a higher reach to a lower, the procedure is reversed. In large locks the sluices may be carried through the walls instead of being in the gates. The material of which the gates are composed is generally hardened oak; in small narrow locks a single gate at each end is sufficient. The gates are opened and closed by balance beams projecting over the lock side, which are worked either by gearing or by a hydraulic ram. The locks are not much larger than the vessels they are required to take. The Eng. C. boat is from 70 to 75 ft long and 7 or 8 ft wide; a barge is the same length, but double the width, i.e. from 14 to 15 ft. The average lift of a C. lock is from 8 to 9 ft, sometimes as little as $1\frac{1}{2}$ ft. In Belgium, on the Canal du Centre, the locks have a lift of 17 ft, whilst 1 lock on the Saint-Denis C. has a lift of 32½ ft. When there is a very big difference in the levels of the 2 reaches of the C., it is sometimes overcome by a flight of locks, in which the lower gates of one lock form the higher gates of the one below it. On many of the Eng. C.s an inclined plane is

placed at the side of the lock for the use of pleasure boats; the boats are placed on the rollers which form the plane, and hauled over by hand. The same principle is sometimes used for barges, but as such a method is liable to strain the timbers, etc., of large vessels, a more common arrangement is for 2 counterbalancing tanks to be used. Each of the tanks holds sufficient water to float a boat, 2 lines of rail are used, on which the tanks run, and they are connected by chains running on pulleys in such a way that as one ascends the other descends. Vertical lifts are also employed on some C.s; they are only used where the difference in the levels of the reaches occurs in a short length of C. to obviate the construction of embankments, etc. At Anderton there is such a lift, which deals with barges of as much as 100 tons burden and has a lift of 50 ft. The horse is still used for haulage on the small C.s. Steam towage was first introduced about the beginning of the 19th cent., but tugs towing a string of barges are only practicable when there are no locks on the C., or when the locks can take the tug and all the barges at the same time. Barges having a steam or oil engine of their own are now utilised; on a portion of the Tetlow C., in Germany, an electric system of traction was put into use. The ordinary speed of a horse-drawn C. boat is from 2 to 3 m.p.h.; if an excessive speed is attempted, the wave raised washes away the sides of the C. much more quickly, and the water is disturbed for a long distance along the C.

Canals in the United Kingdom. Great Britain was one of the last nations to make any use of C.s. The first C. was Bridgewater C. (q.v.). The successful accomplishment of this work encouraged others, and before the introduction of the railways the length of the navigable C.s in Great Britain was estimated at 3000 m. The largest C.s in Great Britain are the Caldonian C. (q.v.), the Crinan C., the Forth and Clyde C. in Scotland, and the Gloucester and Berkeley Ship C. (17 m.) in England. Other main C.s in England and Wales are the Manchester Ship C. (35 m.) (q.v.), the Grand Union (280 m.), the Birmingham (160 m.), the Leeds and Liverpool (190 m.), the Aire and Calder (90 m.), the Trent Navigation System (120 m.). The first C. to be modernised in England was the Grand Union, which links London with Nottingham and Birmingham. The work of dredging and deepening was completed in 1934, and the C. can now carry motor-driven barges at greater speed. The Nene R. was also canalised with locks to take ships of 15-ft beam, and linked with the Grand Union, thus providing a through waterway from the Wash to the Bristol Channel, and, at the same time, joining Birmingham and Manchester with London. There are in all 3641 m. of waterway in England and Wales, 184 m. in Scotland, and 848 m. in Ireland. The total extent of C.s in use in Great Britain is about 2500 m. In 1948 most of the important inland waterways (2000 m.) in Great Britain were taken over under the Transport Act, 1947,

by the Brit. Transport Commission, placed in the charge of the Docks and Inland Waterways Executive, and organised into 5 areas with H.Q. in Leeds, Northwich, Nottingham, Gloucester, and London; ann. tonnage about 10 million. The Bridgewater, Manchester Ship, and Thames Conservancy are not included in these arrangements, and the ann. tonnage carried by them is nearly 20 million. The C. Association and the Inland Waterways Association have done much to obviate neglect of Brit. waterways. Some C.s are choked with weeds and mud, rendering navigation impossible; often the lack of adequate dredging, together with leaky locks, greatly delays traffic.



THE CANAL SYSTEM OF ENGLAND

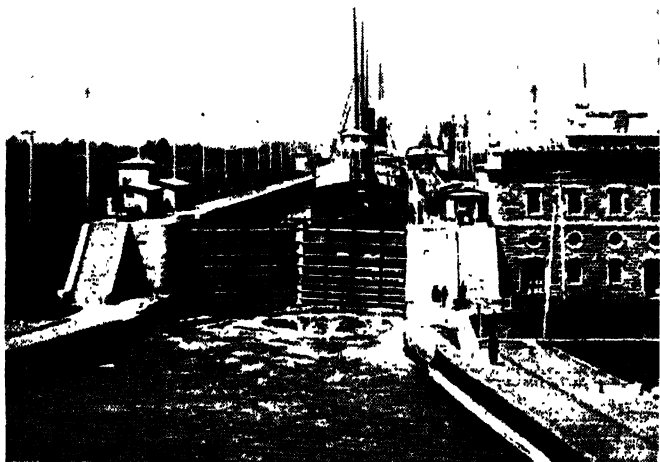
Continental canals. Belgium occupies a foremost place in inland navigation; it had, before the First World War, a length of C.s amounting to 1360 m., which is 1 m. of waterway to every 8½ sq. m. of ter. Today, the total length of C.s and navigable rivs. is still over 1000 m. The Albert C., connecting Antwerp and Liège, a distance of some 80 m., was completed just before the outbreak of the Second World War. It can carry barges up to a burden of 2000 tons, and is over 80 ft wide at its narrowest, with a depth of 16 ft. Work was also carried out to widen and deepen the Charleroi-Brussels C. In the Netherlands, the Princess Juliana Ship C. was opened in 1935, 20 m. in length with a depth of 16 ft and a width of 50 ft. Another modern C. is the Twente C. from Zutphen to Enschede, opened in 1936. Since the days of the first C. in France, which was constructed between 1603 and 1641, the French have on the whole been keenly alive to the advantages of this method of transport. The Languedoc C., or C. du Midi, connects the Bay of Biscay with the Mediterranean; it is 148 m. long and has

119 locks, but is only 6½ ft deep. The Fr. Gov., whilst developing the railways of the country, did not overlook the C.s, and there are 6000 m. of navigable waterways with total traffic of about 40,000,000 tons. Many of these waterways are maintained entirely by the State, and no tolls are levied. The Fr. Gov. in 1879 introduced a law to secure uniformity in the dimensions, etc., of the prin. C.s. By the above law all C.s must have a depth of 6½ ft, locks must measure 126½ ft by 17 ft, and a space must be left under bridges of 12 ft, thus enabling boats of about 300 tons burden to travel along all the prin. Fr. C.s. Prior to the outbreak of war in 1939, considerable work was carried out in improving the existing waterways and in installing electrical machinery at many of the locks on, for example, the Rhine-Rhône C. and elsewhere. In Germany, between the 2 world wars, an ambitious scheme was launched for joining, by canal, the R.s Oder, Elbe, Weser, and Rhine, extending to nearly 7000 m. of C. The last link in this chain was completed in 1938, the Mittel-land C. from Magdeburg through Brunswick and Münster to the Rhine, joining with the Dortmund-Ems C. The Soviet Gov. has aimed at making Moscow an important inland port, linking it with the Volga and thence with the White Sea, the Baltic, the Black Sea, and the Caspian. The Moscow-Volga C. was completed in 1937, giving about 80 m. of navigable waterway, and work was then begun on the Volga-Don C. between Stalingrad and Rostov. In Sweden, the Göta C. system links the Cattegat, through the lakes, with the Bothnian Bay.

Canals in the U.S.A. and Canada. In America there are numerous C.s which connect the separate riv. navigations. The St. Lawrence C.s. between Lake Ontario and Montreal, and the Welland C. join Lake Erie and Montreal; the last-named is nearly 27 m. long and rises by means of locks to over 320 ft (see WELLAND). The size of these C.s has been increased, and now the locks are 270 ft in length, 45 ft in width, and 14 ft in depth. A C. at Sault Sainte Marie connects Lake Superior with Lake Huron to avoid riv. rapids. The Chesapeake and Ohio C. was begun in 1828, and by 1850 extended from Georgetown on the Potomac to Cumberland. This C. connects Maryland with Washington, D.C., thus enabling coal to be brought from the Cumberland region to the Potomac R. It is 184 m. long and has 73 locks. The Erie C., which connects Lake Erie with the Hudson R., is 365½ m. in length; the width at the bottom varies from 53 to 79 ft, that at the surface from 70 to 98 ft, whilst the depth ranges between 7½ and 9½ ft. The Delaware at Phillipsburg and the Hudson R. at Jersey City are connected by the Morris C., which crosses a spur of the Alleghenies by a system of inclines; it is 102 m. in length. The Chesapeake and Delaware C., a part of the toll-free Atlantic inland waterway, was taken over by the State in 1919. The Dallas and Cello C., completed in 1915, allows of riv. navigation up the Columbia

and Snake R.s for nearly 600 m. from the ocean. The ship C.s generally of the U.S.A. are of great economic importance, but the same cannot be said of the inland C. system. One fairly recent experiment is the State Barge C., New York, which connects New York city with Buffalo by a deep-water route of 790 m. and has a minimum depth of 12 ft, but it costs the taxpayers of the state \$7,000,000 annually, and only a negligible fraction of the expected traffic passes over it. It was, however, deepened in 1941 to a depth of 14 ft between the Hudson R. and Lake Ontario. The Cape Cod C.,

were too shallow. Only a narrow strip of land had to be excavated between Velsen and the N. Sea, as the direct route passed through Lake Y and Wijker Meer. Banks were formed along the C. by the soil which was dredged from the bottom in order to deepen the C., and by this means a considerable extent of ter. was reclaimed from the sea, and so a portion of the cost was realised. The C. is suited for large vessels, having a bottom width of 88 ft, a width at the water level of 186 ft, and a depth of 23 ft; it is 16½ m. in length. The level of the C. is kept only 14 in. above low water in the N. Sea in order to maintain



Canadian Government

LOCKS AT SAULT SAINTE MARIE, ONTARIO

built in 1914, to connect Buzzard's Bay with Massachusetts Bay, was taken over by the State in 1928 to become a toll-free section of the Atlantic inland waterway, and it has since been deepened and widened. Work on the canalisation of the Ohio R. was undertaken to provide a greater depth for the whole 1000-m. length. The Chicago Drainage C., constructed to discharge the Chicago drainage into the Upper Mississippi Valley instead of into Lake Michigan, has now, through the construction of a connecting Illinois waterway, become a link in a waterway from the Great Lakes to the Mississippi.

Ship Canals. C.s designed to admit large ocean-going vessels are constructed either to place inland tns in communication with the sea, or to shorten the distance by sea between 2 points by cutting across an isthmus. The Amsterdam Ship C. severs the peninsula of N. Holland and unites the IJssel Meer (Zuider Zee) with the N. Sea, but its real object is to allow the trade of Amsterdam a more direct outlet, as the N. Holland C. and the IJssel Meer

the drainage of the reclaimed lands. The inflowing water from these lands and from the branch C.s is pumped into the IJssel Meer by pumps situated in the dam which shuts off the C. from the IJssel Meer. The entrance channel is protected by 2 converging concrete breakwaters, and the C. is controlled by locks near each end with gates pointing both ways. The C. was begun in 1865, and finished in 1876, at a cost of about £2,600,000. (*See also MANCHESTER SHIP CANAL.*) Among other C.s of this nature may be mentioned the Bruges Ship C., which renders Bruges a seaport; the Ghent-Terneuzen C., which provided an outlet for Ghent by a C. joining the estuary of the Scheldt at Terneuzen, enlarged and deepened in 1870 so that vessels of 1400 to 1700 tons can reach Ghent; and the Leningrad and Kronstadt Ship C., which enables seagoing vessels to reach Leningrad. This C. starts from the Neva and goes SW. for about 2 m., when it curves and proceeds in a straight line to Kronstadt. It was begun in 1877 and finished in 1884, at a

cost of £1,210,000. The first C. which cut across an isthmus to enable ocean-going ships to use a shorter route was the Suez C. (q.v.). (See also PANAMA CANAL.) In very early times it was proposed to build a C. across the isthmus of Corinth, and traces are found of works for such an undertaking begun in the time of the Emperor Nero. The C. was begun in 1882 and finished in 1893, at a cost of between £1,000,000 and £2,000,000. It is 4 m. in length, with a bottom width of 72 ft, and a depth of 26½ ft; the entrances at each end are protected by solid jetties built out into the sea. The Holstein C. connects the R. Elbe with the Baltic near Kiel, but is only 51½ ft wide at the bottom, and 9½ ft deep, being only useful for small vessels. The Baltic Ship (Kiel) C. was therefore built between the Baltic and N. seas, starting from Holtenau near Kiel, where a great lock was constructed, and joining the Elbe at Brunsbüttel. The length of the C. is 60 m., width at the bottom 85 ft, 190 ft at the top, and depth 28 ft. The C., which saves the vessels using it a distance of 237 m., was begun in 1887 and finished in 1895, at a cost of about £8,000,000. See S. Smiles, *Lives of the Engineers*, 1864; R. C. R. Minikin, *River and Canal Engineering*, 1920; H. R. de Salis, *Bradshaw's Guide to the Canals and Navigable Rivers of England and Wales*, 1928; G. Cadbury and S. P. Dobbs, *Canals and Inland Waterways*, 1929; A. Wilson, *The Suez Canal: Its Past, Present, and Future*, 1939; L. T. C. Rolt, *Narrow Boat*, 1944; F. Eyre and C. Hadfield, *English Rivers and Canals*, 1945.

Canale, Antonio, called **Canaletto** (1697–1768), Venetian painter, trained under his father Bernardo C., a scene painter; first distinguished himself by painting decorations for theatres. In 1719 he went to Rome to study the works of the old masters; and on his return to Venice painted many views of that city. Smith, the Brit. Consul in Venice, bought many of his works, a number of which passed into the collection of George III, and are at Windsor Castle. He worked much in London between 1746 and 1755, painting some excellent views of the Thames and the well-known 'Interior of the Rotunda, Ranelagh' (1754). The Louvre has 6 of his pictures, the National Gallery 11. He was a prolific artist and his pupil and nephew Bernardo Bellotto (c. 1724–80) added to his many Venetian views similar in style. C.'s topographical drawings had their influence on such Eng. water-colourists as Girtin. See K. T. Parker, *The Drawings of Antonio Canaletto in the Collection of H.M. The King at Windsor Castle*, 1948.

Canaletto, see CANALR, ANTONIO.

Canalgre (*Rumex hymenosepalus*), plant of the S. U.S.A. A tanning substance is obtained from the rootstock, which gives a rich orange colour and imparts softness of touch to hard leather.

Cañar, see AZOGUES.

Canara, see KANARA.

Canard, archaic French for broadsheet, deteriorated in meaning to false report or hoax.

Canaris, Constantine, see KANARIS.

Canary Bird, or **Canary Finch** (*Serinus canarius*), passerine bird of the family of Fringillidae or Finches. It is found in large numbers in the Canary Is., Madeira, and the Azores, but has been domesticated in Europe since the 16th cent., and is one of the most common of cage-birds. In its wild state the plumage is green, sometimes streaked with brown, and resembling that of a linnet or siskin, the prevalent yellow of the domestic species being the result of artificial selection for breeding purposes. The artificial selection has also resulted in increasing the average size of the bird, the domestic variety being from 6 to 8 in. in length, while the wild variety is only from 4 to 5 in. long. The wild C. builds its nest of moss, feathers, and hair, in thick high shrubs or trees, and produces 2 to 4 broods in a season, but it breeds readily in confinement, sometimes laying from 4 to 6 eggs, pale blue in colour, 4 times a year. The work of building the nest and of incubation is generally the part of the female, while the cock-bird usually feeds the young. The natural song of the C. is loud and clear, and during the mating season the males seem to compete with one another in the ardour and beauty of their melody. It can be taught various notes, and readily imitates the notes of other birds. Their chief foods are canary and millet seeds; groundsel, chickweed, and sugar are appreciated luxuries. C.s mate readily with siskins, goldfinches, greenfinches, and linnets: the cross-breeding of C.s is a favourite occupation in the Tyrol. The chief varieties of the domesticated C. are the Norwich, which is the hardest, and of a very rich colour; the Belgian Fancy, the most beautiful and costly; the Lizard, so called from its spotted back; the Cinnamon, so named from its colour; the Yorkshire, a long, thin, closely feathered bird; the Lancashire Coppy, the largest variety, with a crest of feathers on its head; the London Fancy, a little yellow or biscuit-coloured bird with black wings and tail; the Scotch Fancy, a large imposing variety, bred largely in Scotland; and the Roller C., a very small bird, bred chiefly for its unusually beautiful song. There are sev. varieties of finches very closely allied to the C. and often sold as such, but they are generally very inferior as song birds. See F. J. Chatterton, *Canaries and how to keep them*, 1924; C. B. Upton, *The Breeding and Management of Canaries*, 1934.

Canary Islands (Sp. *Islas Canarias*), group of Sp. is. in the Atlantic, lying 60 m. off the NW. coast of Africa, W. of Rio de Oro (q.v.). They consist of 7 main is., Gran Canaria, Fuerteventura, Lanzarote, Tenerife, La Palma, Gomera, and Hierro (qq.v.), and 6 small is., Graciosa, Rocca, Allegranza, Santa Clara, Inferno, and Lobos, and they are grouped into 2 provs., Las Palmas and Santa Cruz de Tenerife (qq.v.). The aboriginal inhab. were called *Guanches* (q.v.), and the is. were known to the Phoenicians and the Romans. In 1402 a Norman, Jean de

Béthencourt, subdued some of the is. By the end of the 15th cent. the whole archipelago had been joined by Ferdinand II (q.v.) of Aragón to the new Sp. kingdom. The is. are all rugged, mountainous, and volcanic, but the soil, where irrigated, is very fertile. Bananas, tomatoes, and potatoes are the prin. exports. Cochineal was an important manuf. until the discovery of aniline dyes. Canary wine was celebrated until the vines were attacked by phylloxera in the 19th cent. There is a considerable tourist industry, and the is. are popular with invalids during the winter months. Pop. 824,500. See D. A. Bannerman, *The Canary Islands*, 1922.

Canary Wood, timber of 2 trees of the Canary and Madeira Is., *Persea indica* and *P. canariensis* respectively, belonging to the Lauraceae family.

Canasta, card game, a development of Rummy, originating in Montevideo and growing enormously popular in the U.S.A. and Britain after 1948. It is normally played by four people, two a side, with two full packs plus jokers. The four jokers and the eight deuces are 'wild'—that is, may be named as any other card. Each player receives eleven cards; the next is turned up beside the stock pile, which is placed in the centre of the table. If the turn-up card is a joker, a two, a black or a red three, the next card is turned up to cover it, and so on. Each player in turn draws the top card of stock or of the discard pile, 'melds' (places face-up in front of him) any cards he is able and willing to declare, and then discards. A meld is compulsory if the top card of the discard pile has been taken. A meld consists of three or more cards of the same rank and must contain at least two 'natural' and not more than three 'wild' cards. The first meld may be made only when the cards declared score a minimum which varies according to the points previously scored by the partnership. From 0 to 1500 points the minimum meld is 50; 1500 to 3000—90; 3000 or over—120; a minus score—15. Only the top card from the discard pile may be counted towards the minimum score. A melded joker scores 50 points, aces and deuces—20; K to eight—10; seven to four and black three—5 points. A player may meld three or four black threes from his hand only when melding out at that turn. A C. is a meld of seven or more cards of the same rank whether declared at once or built up gradually, and must contain four or more natural cards. A natural C. scores a bonus of 500 points over and above the points scored by the cards taken individually, and a 'mixed' C. 300 points. A player cannot 'meld out'—that is, lay down the last cards in his hand—until the partnership has declared a C. For melding out he receives 100 points, for melding out a complete hand at one turn without having previously melded, 200 points.

A player may in his turn add cards from his hand to previous melds of the partnership. Except when melding out a player must both discard and keep one card in his

hand. If in drawing a player lifts and melds the top of the discard pile he must take the whole pile. If he wants the discard pile for the partnership's first meld he must lay down two cards of the same rank as the top card. After the first meld either partner may take the discard pile by laying down one wild card and one of the same rank as the top card or by adding the top card to a meld already made. This last right lapses if the pile contains a red three or a wild card; the pile is then 'frozen.' A discarded black three is a 'stop' card and may not be taken by the next player at that turn, but the pile is not frozen.

If a player is dealt red threes on his first turn he declares them and replenishes his hand from stock. If the round ends before he has done so the partnership is penalised 500 points for each red three in the hand. When a player draws a red three he must declare it and draw again. For each declared red three a partnership scores 100 points.

As soon as one player melds out play stops. All cards unmelded at the end of a round count against the partnership. The full game is played up to 5000 points.

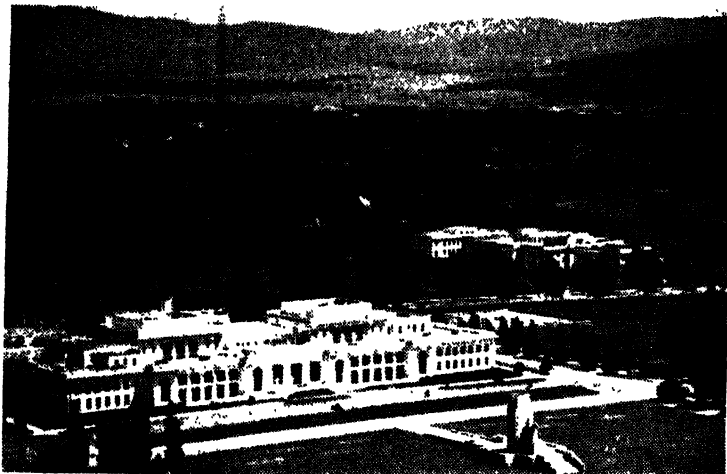
Canberra, federal cap. of Australia (q.v.), 204 m. from Sydney and 429 m. from Melbourne, situated 2000 ft above sea level. The Australian Capital Terr. which includes 28 sq. m. at Jervis Bay, is 939 sq. m. in area and contains a cluster of peaks 5000 ft in height. The Commonwealth has set out to make C. one of the most beautiful cities in the world; parks have been made, fine roads constructed, and trees planted. A temporary Parliament House was opened by the Duke of York on 9 May 1927, 26 years after the opening at Melbourne of the first federal Parliament by his royal father, King George V. As well as the research schools at the Australian National Univ., there are sev. centres for scientific research, the more important being the Australian Institute of Anatomy, the Plant Industry and Entomological laboratories of the Commonwealth Scientific and Industrial Research Organisation, the Australian Forestry School, and the Commonwealth Observatory at Mt Stromlo. Pop. of ter. 33,470. (See photograph, p. 38.)

Cancer, or the **Crab**, the fourth sign of the zodiac (q.v.), which the sun enters about 22 June.

Cancer, in pathology, a malignant growth. A malignant growth may be defined as the appearance in a single area of cells which divide and grow in a manner unrelated to the needs of the body. After the needs of normal growth have been satisfied and with ageing there is a general lessening of the reproductive activity of the body cells. That they still retain their capacity to divide and multiply, however, is evidenced by the continual replacement of those lost in the course of wear and tear. The blood-forming organs, for example, remain active throughout life and the epithelial cells of the skin and mucous membrane are always balancing the loss from daily usage by reproducing their kind. When tissue continuity is

broken by wounding or other cause the surrounding cells multiply and push forward to bridge the gap so that, in the process of healing, lost tissue is to a large extent replaced. These activities are those of a normal growth for the purpose of maintaining the organism intact. Malignant growth, however, has no such purpose. It is a purposeless, abnormal cell growth, unresponsive to ordinary biological control, and therefore autonomous. When normal development of an individual takes place, the cells grow and divide, and become specialised for certain work, that is, they become

of the connective tissues. Carcinoma is the more common C. of the 2 and tends to be a disease of later life, while sarcoma may affect people of any age. The original source of malignant growth is known as the primary C., and the organ in which it grows as the primary site. Metastatic malignant growths are known as secondary C.s, and where they take root is known as the secondary site. Primary C. may start in any tissue, but certain sites are more liable than others. Thus the oesophagus, stomach, colon, and rectum are well-known sites of primary C. in the alimentary canal. For some reason



Australian Official Photograph

FEDERAL PARLIAMENT HOUSE, CANBERRA

The building to the right is west block, which accommodates several government departments. Among the trees in the background is the U.S. embassy.

differentiated. In C., these differentiated cells degenerate, returning almost, but not quite, to their primitive condition, and in so doing they regain some of their primitive capabilities. They resemble embryonic cells in their power of extensive multiplication, but differ from them in retaining some semblance of their differentiated form; e.g. a C. of the liver contains cells which have the form of normal liver cells, and even though such a C. may migrate to another part of the body, and continue its growth, the tissue in which it was originally formed can be detected by examination of the cancerous cells. It is this power of migrating and forming secondary growths (metastases) in other parts of the body which forms one of the chief distinctions between C. and other tumours.

There are 2 main types of C.—the carcinoma and the sarcoma. Carcinoma originates from the epithelial cells of the body, whereas sarcoma grows from those

unknown, the small intestine is rarely affected. Of glandular structures, the thyroid, the ovary, the cervix uteri, and the breast in the female, and the prostate in the male, suffer most. The true primary C. of the skin is the epithelioma, but another kind, the rodent ulcer, is partially malignant only, since it invades and destroys tissues locally but does not metastasise. The predilection of primary C. for certain sites is not fully understood, but it seems clear, in some cases at all events, that chronic irritation plays a part. Metastases, or secondary C.s, may appear anywhere, but again certain sites are more common than others. The mode of spread from the primary C. is by means of the lymphatic channels and the blood stream. Secondary C.s which are distant from the primary have usually been carried by the blood stream, while the secondary C.s originating from lymphatic spread are as a rule to be found in the chain of lymphatic glands into which the

lymphatic channels from the site of the primary C. drain. Thus a primary C. in the breast will cause secondary C.s of the axillary lymphatic glands, and an epithelioma on the cheek will cause secondaries in the cervical, or neck, glands. Because of its large blood supply, the liver is a frequent site of secondary C., particularly if the primary C. is in the alimentary canal. The recorded deaths from the disease have shown a steady increase during the last 50 years. In 1906 939 people per million of the pop. died of C. In 1930 the number was 1454, and in 1950 it was 1901. But these figures do not necessarily reflect a real increase in incidence of the complaint. For instance, the expectation of life is greater now than it was at the beginning of the cent., which means that more people to-day live to reach the C. age. Diagnosis is more accurate now than it was, so that the mortality statistics reflect the state of affairs more truly than in earlier years. Although it is probable, therefore, that the overall incidence of C. has increased little, if any, there is no doubt that C. of certain sites has increased, while it has decreased in others, and in others still it has neither increased nor decreased. Thus C. of the mouth and of the skin is less common than it was, whereas the figures for C. of the lung have shown a sharp increase, and are still increasing. Analysis of mortality statistics from various localities and various social classes show that, although there may be some common aetiological factor, C. is a disease of diverse aetiology. Its appearance in different parts of the body results from various specific irritants which may be ingested, inhaled, absorbed, or even produced by the body itself. Statistics have already supplied the clue to the nature of some of these irritants, and in the case of lung C. smoking is undoubtedly an aetiological factor. C. resulting from certain industrial hazards has been proved and the appropriate measures have been taken to guard against the risk.

So long as the essential biological mechanism of cell growth, both normal and malignant, remains unknown, it cannot be said that any real preventive treatment of C. is available. The main treatment, as always, must be that of extirpating the primary growth as quickly as possible. Yet the insidious and often symptomless onset of the disease, especially when in the deep-seated tissues, makes all-important early recognition, by patient and surgeon alike, often a matter of difficulty. By the time the growth is diagnosable beyond doubt metastases have usually occurred and it is less likely that treatment will avail. Research is going on continually and progress has been made not only in perfecting physical aids to diagnosis but also in pathological methods. There is some reason to hope that a diagnostic serum reaction specific for C. may evolve from research now proceeding, and which has already shown some promise. The treatment of C. is one of the greatest problems of medicine. Surgery and radiotherapy remain the 2 chief methods, but

lately certain treatments which involve a readjustment of the natural hormone secretions have been followed up and have shown considerable promise, particularly in those cases of widespread secondary C. which, from the nature of things, are not amenable to local extirpation of the growth. A great increase in the scope of surgical treatment of C. has come about as the result of modern anaesthesia and the application of present-day knowledge of physiology. The patient can now be subjected to prolonged and extensive surgical procedures of a kind which would formerly have been out of the question. Parts of the body at one time inaccessible to the surgeon are now amenable to operation. The complete excision of primary C. in its early stages in more or less any organ is now a practical proposition. The eradication of secondary C.s, however, is often beyond the province of surgery and here radiotherapy, either by X-rays or radium, is the treatment of choice. A combination of surgery and radiation is sometimes employed. Radical radiotherapy aims at cure by destroying the malignant cells without too much damage to adjoining normal tissues. To adjust the dose to achieve the object is one of the problems of this method of treatment. Clearly the nearer the C. is to the surface of the body the more accessible it is to radiation, but recent advances in physics have put more powerful agents at the disposal of radiologists. The cyclotron, an apparatus which disintegrates the atom, and the more lately developed betatron and synchrotron are instruments which, working at 30 million volts, are capable of providing gamma rays of such penetrating power that they are effective against deeply situated malignant tumours. Another development is the use of the waste products from the atomic piles now being used to provide atomic energy for peaceful purposes. These products are known as radioactive isotopes. Some of these radioactive isotopes, notably radio-phosphorus, radio-iodine, and, lately, radio-caesium, have a selective action on certain C.s, and when injected into the body they concentrate in the malignant cells and destroy them. Much research has yet to be done in this field, yet obviously to be able to inject a substance into the blood stream which will seek out and destroy C. on its own ground is a therapeutic ideal if it can be carried out without harm to the body as a whole. Another promising field of research is that of hormone treatment. It has long been known that the ductless glands act as a team and the activities of one are dependent on the activities of the others. The prostate gland, for example, depends for its normal function on the testicle, and it was observed that C. of the prostate is considerably accelerated by the administration of the male sex hormone. From this it was but a short step to discover whether administration of the opposite, or female, sex hormone in these cases would impede the growth. Such was found to be the case. This discovery has opened up many possibilities, and most

recently considerable success has been achieved in cases of multiple secondary C., incurable by any other means, by removing surgically the suprarenal glands (q.v.) and thus cutting off the body's natural supply of the cortico-steroid hormones. Generally speaking, it may be said that therapeutics, though they have not actually caught up with C., are close on its tail.

But the *cause* of C. is still unknown. It is probable that many different causes may operate, and good work has been done in investigating probable causes by researches conducted under the auspices of the Imperial C. Research Fund. The able administration of this fund and the unselfish co-operation of medical men and scientists throughout the empire has led to the accumulation of a body of statistical and experimental knowledge, which, though it has had no very definite results, has put the inquiry on a proper footing. Many investigations have been conducted with a view to finding a specific micro-organism for C., but without satisfactory results. None of the claims made to have isolated a C. bacillus have been estab. Cases are quoted too which appear to show that an embryo escapes the disease although the uterus may be diseased, and on the other hand, a child may be born from a healthy womb with C. developed at an early period in its foetal life. The effect of irritation in the formation of cancerous growths has been widely discussed. There is no doubt that irritation is often at least a predisposing cause, and chimney-sweeps' C., to which sweeps at one time were peculiarly liable, was caused by the irritating effect of soot, as was first noticed in 1775 by an Eng. doctor, Percival Pott. The active carcinogenetic principle of coal-tar has now been isolated as benzopyrene; other similar substances are also being investigated. The chewing of betel-nut and the eating of hot rice in China have been shown to be associated with cancerous growths. Irritation may also be produced within the body by chemical means, e.g. alcohol is known to promote the degeneration of cells, and arsenic to stimulate their activity. The connection between smoking and lung C. has been estab. beyond doubt. Over-exposure to X-rays or to ultra-violet rays, or to radium, causes the rapid and premature degeneration of cells and the formation of C., but carcinogens produce a change only in the manner of the growth of the cell; they do not provide the continuing stimulus. The mechanism for unlimited growth lies in the cell itself, and what this mechanism is we do not know. In 1955 Otto Warburg, of Berlin, pub. his theory on the cause of C. It is known that a cell needs oxygen to live and to produce energy. But a cell can produce energy not only by respiration but also by fermentation. Warburg's theory on the difference between a C. cell and a normal cell is that a C. cell can obtain as much energy from fermentation as from respiration, while a normal cell obtains more energy from respiration than from fermentation. When a normal cell is injured

its respiration suffers, and one way of injuring a cell is to deprive it of the means of respiration—that is to deprive it of oxygen. It then resorts to fermentation instead of respiration. A carcinogen, therefore, is any agent which poisons a cell by impairing its respiration. But not all poisoned cells become C. cells. Some respiration may continue together with fermentation and, according to Warburg, it is not until fermentation has entirely supplanted respiration that a normal cell changes to a C. cell. This may never occur or it may take a long time. It is well known that the interval between the introduction of a carcinogen to normal cells and the appearance of the subsequent malignant growth which it causes may be several years. There is a 'pre-cancerous' stage of cell life, and this would fit in with Warburg's theory. He suggests that if those pre-cancerous cells in which fermentation is not fully estab. could be killed by some chemical which did not affect normal cells then a cure for C. would be found. There is no doubt that Warburg's theory is an important contribution to C. research.

With regard to the question of heredity, more satisfactory information has been obtained through long extended experiments with many generations of mice; and it has been estab. that mice with a cancerous ancestry are more liable to C. than those born from a healthy line. A strain of mice showing a hereditary tendency to develop, for instance, a mammary C. can only be maintained by constant in-breeding such as would never occur in humans. It is only when information is gathered upon the comprehensive scale adopted by the Imperial Research Fund committees that reliable statistics can be obtained. Those at present available show that C. in man is rarely directly inherited. See W. S. Handley, *The Prevention of Cancer*, 1936; E. L. Hoffman, *Cancer and Diet*, 1937; I. Hieger, *One in Six: An Outline of the Cancer Problem*, 1955; R. W. Raven, *Cancer and Allied Diseases* (Modern Health Series), 1955.

Cancer, name of a genus of decapod crustaceans to which belongs *C. pagurus*, the edible crab. The species live in pairs in holes of rocks. See CRAB.

Cancer, Tropic of, parallel of lat.—a small circle—23° 27' N. of the equator. At the summer solstice in the N. hemisphere the sun is in the zenith at local noon at every place on this circle.

Cancer-root, see BEECHDROPS.

Cancionero, Sp. (and Portuguese *Cancioneiro*) word used to describe a collection of early lyrical poems, especially such a collection as was made by the poetic guilds which flourished in the Middle Ages. The oldest is that made c. 1445 by Juan Alfonso de Baena, a converted Jew, for King Juan II. Its poems belong to the 14th and 15th cents. A later C., attributed to Lopez de (Stunica) Zúñiga, contains songs by poets who accompanied Alfonso V of Aragon to Naples, and afterwards in his imprisonment at Milan. The first *Cancionero General* (pub. in 1511), was that of Juan de Fernández, embracing

lyrics by over a hundred writers, the earliest of whom is the Marquess of Santillano. The earliest of the Portuguese collections is that of King Diniz (1279-1325); the best known is Garcia de Resende's *Cancioneiro Geral*, 1516. These anthologies are important, because of the flood of light they throw on contemporary manners and ideals. See Vollmüller, *Les Cancioneros et Romanceros Espagnols*, 1909.

Cancroma, see BOATBILL.

Candaba, tn on ls. of Luzon in the Philippines, on the Pampanga, 10 m. from San Fernando. It grows rice and sugar, and there are fisheries. Pop. 16,036.

Candace, title of sev. Ethiopian queens regnant. In 24 and 23 BC one of them, Ameniremas C., was involved in war with Rome. Imperial troops under Gaius Petronius, prefect of Egypt, invaded her ter. and occupied the capital, Napata. Augustus, however, ordered their withdrawal without even demanding tribute.

Candahar, see KANDAHAR.

Candela, It. tn in Apulia (q.v.), 22 m. S. of Foggia (q.v.). Pop. 9000.

Candelabrum (Lat. *candela*, a candle), large candlestick, and also a lampstand. Candelabra were used by the Romans for domestic purposes and also in sacred rites. They were generally made according to one design, with a base formed of 3 or more feet of some animal, the shaft branching off into arms which ended in spikes for candles or in flat disks from which lamps could be suspended. Specimens have been found in Pompeii, Herculaneum, and Etruria. Some are beautifully wrought in various metals; others are more massive and are carved in marble.

Candia, officially *Heraklion*, largest city and chief port of Crete; it is situated to the N.E. of Mt Ida, almost in the centre of the N. coast. The city was founded by the Arabs in the 9th cent. It was held by the Venetians from 1207 till 1669 when the Turks captured it after a 21 years' siege. Hostilities between the Muslim and Christian inhab. have been frequent. In 1897 Greece became involved in a war with Turkey on behalf of the Christian residents of the is., when for nearly a year C. was under blockade. The tn is very picturesque with its bazaars and mosques and old Venetian fortifications. Fruit, vegetables, and olive oil are exported. There are some industries concerned with processing agric. products. C. is on the site of the port of the anct. Cnossus, the city of Minos. Pop. 51,150. See CNOSSUS.

Candidate (Lat. *candidatus*, white-robed, because Rom. candidates wore white), one who takes steps towards fulfilling his aspirations for any office, post, or honour, especially one who stands in a parl. election. Technically there is no legal decision as to when the aspirant becomes a C. He is popularly recognised as such when he enters on an active campaign for the promotion of his object, whilst certain judges regard the appointment of the election agent as the sanction of his candidature.

Candle, source of artificial light. C.s

are usually cylindrical in shape and are made of waxes or other solid fatty material enveloping a wick of cotton, or (rarely) linen. Until the middle of the 18th cent., beeswax and tallow (q.v.) were the only materials employed in the manuf. of C.s. Subsequently spermaceti, coco-nut oil, stearine, and paraffin wax were introduced, in that order. Paraffin wax is by far the major component of household C.s throughout the world. There are 5 methods of manuf.: dipping, moulding, pouring or rolling, drawing, and extrusion. (1) *Dipping*. Dipped C.s are made as follows: a number of wicks of suitable length are suspended on a frame spaced about twice the intended diameter of the C.s. The frame with the wicks is then dipped into a vessel of molten wax, withdrawn and allowed to cool, immersed again and the operation repeated until the intended thickness or weight is obtained. In some cases final shaping is imparted to the C.s mechanically. Dipping is now mainly confined to paraffin wax and stearine C.s for dinner table and decorative purposes. (2) *Moulding*. For moulding a machine is used comprising a number (possibly 500) of burnished tin moulds set in a tank of cooling water. Through the centre of each mould a wick is stretched and the moulds are filled by pouring molten wax into a trough above the top of the tank. After the wax becomes cool it is ejected from the moulds by the aid of pistons which themselves form the tips of the C.s. Moulding is now the most common method of candle-making, particularly for ordinary household C.s. (3) *Pouring or rolling*. Altar C.s for the Rom. Catholic church must, according to the Rubric, consist 'in the greater part' of beeswax. Such C.s are usually made by pouring. Lengths of wick are hung up round a wooden hoop, the beeswax mixture poured over the wicks, time allowed for hardening, and pouring repeated until the size and shape required are attained. C.s are then rolled between a smooth board and a marble slab to impart a regular finish, cut to length, and tips shaped. (4) *Drawing* is a method of manuf. by which a long length of wick is drawn continuously through a bath of wax until the required thickness has been built up, when the C.s are cut to size and tipped on a separate tipping machine. (5) *Extrusion*. Since 1951 the production of C.s by extrusion from either solid or powdered wax through a die has been introduced commercially and is tending to replace moulding. Candlewick is usually made from cotton and following the invention of Cambacères in 1825 has usually been plaited or braided. Such construction, together with impregnation with suitable chemicals, controls burning so that the tip of the wick burns off cleanly in the hot edge of the C. flame and does not need snuffing to remove accumulations of carbon. Tapers consist of a thick loosely twisted wick thinly covered with waxes and are used for gas lighting, etc. Night lights may be described as short C.s fitted with a thin wick so that they burn

slowly with a small flame. The wick is furnished with a metal sustainer at the base to prevent it collapsing. The standard for illuminating power is a spermaceti C. burning at the rate of 120 grains per hour. The ordinary household C. is about 1½ candle-power.

Candle-fish, or **Oulachan** (*Thaleichthys*), name of a genus of fishes of the family Osmeridae; it is closely allied to the smelt. It inhabits the Pacific coast of N. America and contains so much oil—more perhaps than any other animal—that it will burn like a candle.

Candleberry, **Candlenut**, **Varnish-tree**, names given to *Aleurites moluccana*, evergreen tropical tree of the Euphorbiaceae; the seeds of which yield an oil used in varnish and soap making, and in treating woodwork, cloth, etc. C. Myrtle is the Bayberry (q.v.) or Wax Myrtle.

Candlemas, feast of the Purification of the Virgin Mary, celebrated by Rom. Catholics on 2 Feb. The festival gets its name from the fact that on that day there is a procession of candles, and those candles which will be required in divine service for the ensuing year are blessed. The festival of C. is also observed by the Church of England and by the Armenian Church. It has been compared with the Rom. festival held in honour of Februa, mother of Mars, when candles were burnt; possibly the old custom was utilised by the Church and turned into a Christian ceremony. In Scotland C. Day is the first of the quarterly terms, when interest, taxes, rent, etc. must be paid. The state of the weather at this time is said to determine that of the year.

If Candlemas is fair and clear,
There'll be twa winters in the year.

See also J. Brand, *Observations on Popular Antiquities*, 1849, and L. Duchesne, *Christian Worship*, 1903. G. L. Apperson's *English Proverbs and Proverbial Phrases*, 1929, has 3 columns of proverbial sayings relating to C. Day. See PURIFICATION.

Candlenut (*Aleurites triloba*), tropical species of Euphorbiaceae which is grown on account of the oil and the dyeing properties contained in the nut. The flowers are large and white, and the fruit is the size of a walnut. See also CANDLE-BERRY.

Candleish, Robert Smith (1806-73), Scottish preacher, graduated at Glasgow Univ. in 1823, and after 3 years' study in divinity, accepted a tutorship to a Scottish boy at Eton. His appointment to St George's, Edinburgh, at once brought him into prominence. After his first speech in the Assembly in 1838, he came to the forefront of those who later constituted the Free Church, and the part that he played in securing the Disruption was second only to that of his friend and leader, Dr Chalmers. Moderator of the Assembly in 1881, he accepted the principalship of New College, Edinburgh, in the following year. C. worked unceasingly to secure the union of the various dissenting Presbyterian sects, and the speedy advancement of public education.

Candolle, Augustus Pyramus de (1778-1841), Swiss botanist, b. Geneva, of an ancient noble Provençal family. He came to Paris in 1797 for the purposes of study, and pub. (1802) *Astragalogia*. Two years later he obtained his doctor's degree. His system of natural classification of plants, which was opposed to that of Linnaeus, introduced him to Cuvier and Lamarck. Both prompted him to undertake the pub. of the *Flore française* (1803-15). He began to lecture in the Collège de France in the same year, and in 1805 pub. 4 vols. of the *Flore française*, followed by 6 vols. in 1815. The Fr. Gov. employed him to carry on research work in botany and agriculture in France and Italy during the years 1806-12. He was appointed to the professorship of botany at Montpellier Univ. (1810-16), and held the same chair at Geneva (1816-1841). C.'s most important work was *Regni Vegetabilis Systema Naturale* (2 vols., 1818-21), which was reissued under another name as *Prodromus Systematis Naturalis Regni Vegetabilis* (17 vols., 1824-73), to which he did not contribute more than the first 7 vols. His valuable herbarium was bequeathed to his son, Alphonse Louis. See his *Mémoires et souvenirs* (ed. by his son in 1862), and W. de la Rive's *De Candolle*, 1851.

Candon, city in the Ilocos Sur prov., near the W. coast of the is. of Luzon in the Philippines. It mills sugar. Pop. 22,362.

Candy, see KANDY.

Candytuft, popular name for annuals of the genus *Iberis* (q.v.).

Cane, name applied to sev. plants, but most properly to those belonging to the genus of palms known as *Calamus* from which rattan canes are made. The stems of these plants are thin and reedy, and they are used in bottoming chairs and making ropes and baskets. The rattan C. which is used as a walking-stick is the thick stem of *C. Scipionum*. All the plants which yield rattan come from tropical regions of Asia, Africa, and Australia. The sugar C. is really a grass which is cultivated in the tropics for the sweet juice it contains; its botanical name is *Saccharum officinarum*. The C.s which are employed in making fishing-rods are the plant stems of the large grass, *Arundo Donax*.

Canea, or **Khania**, cap. and chief commercial tn of Crete, situated on the NW. coast, 70 m. from Candia. The tn was built on the site of the ancient Cydonia by the Venetians, who settled here in 1252. The tn was captured by the Turks after a 2 years' siege in 1646. The harbour is poor but there is considerable coasting trade. C. is in the centre of one of the richest areas of Crete and exports olives, olive oil, and garden produce. Pop.: dept. 126,200; tn. 33,200.

Canella, family Canellaceae, genus of 2 species of evergreen trees, the W. Indian *C. winterana* being the wild or white Cinnamon of which the white bark is used as a tonic and stimulant.

Canelli, It. tn, in Piedmont (q.v.). It is in the famous wine-producing prov. of

Asti (q.v.) and its sparkling wine is very fine. It also manufs. nougat. Pop. 9000.

Canelones: 1. Dept. of S. Uruguay, a lowland area at the mouth of the Rio de la Plata. It is one of the most heavily populated depts of the country. Area 1835 sq. m.; pop. 200,300.

2. Cap. of the above dept, 24 m. N. of Montevideo, a trading centre for an agric. dist. Formerly called Guadalupe, it was the seat of the Uruguay Gov. in 1828. Pop. 27,000.

Canes Venatici, 'Hunting Dogs,' a small constellation, added by Hevelius in 1690. They are close behind Ursa Major, and near Bootes and Coma Berenices. The chief objects of interest are Cor Caroli, so named by Halley after Charles II, which is a double star of magnitudes 3 and 6; a spiral nebula, discovered by Lord Rosae, 1845; and a cluster of more than 900 stars of the eleventh magnitude.

Cañete, Manuel (1822-91), Sp. writer and critic, b. Seville. He was for many years Spain's prin. dramatic critic, and strove to raise the standard of the drama of his country. He also did much to make known the hist. of dramatic art in Spain. Among his works are *Un Rebaldo en Granada*, 1845, *El Duque de Alba*, 1945, and lyrics, odes, and letters. He was a member of the Royal Academy.

Caneva, Carlo (1845-1922), It. general, b. Tarcento, Venezia. Entered army, 1866. Served in Abyssinian campaign of 1897; lieutenant-general, 1902. He commanded the troops embarked for Tripoli at the end of Sept. 1911. The conquest of the coast tns was all that he could accomplish, his forces being insufficient. Much cruelty was alleged against them. He was recalled in Sept. 1912, and was not prominent again until he presided over the commission that inquired into the great disaster to the It. forces at Caporetto (q.v.), Oct. 1917.

Canfield, Dorothy (1879-), Amer. author, b. Lawrence, Kansas. She was educ. in U.S.A. and Paris, finally graduating at Ohio Univ., where her father was president. In 1907 she married John Redwood Fisher, and settled on a farm near Arlington, Vermont, where most of her life was spent, except for intervals of travel in Europe and 3 years of relief work in France during the First World War. From 1921 to 1923 she was the first woman member of the Board of Education in Vermont, and later (1938) became president of the Amer. Adult Education Association. Her writings on educational subjects have been both numerous and influential, but represent only one part of her literary work, which covers novels, short stories, plays, literary criticism, and miscellaneous writing. Her trans. of Giovanni Papini's *Life of Christ* became a best-seller in 1923. Among her novels, which are for the most part studies of the problems of middle-class married life, may be mentioned *The Bent Twig*, 1915, *The Brimming Cup*, 1921, *The Deepening Stream*, 1930, and *Seasoned Timber*, 1939.

Cang, Cangue, or Kea, instrument of

punishment used in China. It is a ring or heavy wooden yoke, the weight of which varies according to the nature of the culprit's offence. The man's head and shoulders are fastened into this cage so that he is unable to lie down or feed himself. On the C. is inscribed his name, the nature of his offence, and the duration of his punishment. He is paraded through the streets, and finally left in some open thoroughfare, or at the city gates, till his sentence has expired, which may last for some weeks or even months.

Cangas de Onís, Sp. tn in the prov. of Oviedo. Here Pelayo (q.v.) estab. his court, and near by in the Asturian Mts is Covadonga where he was proclaimed king and where the first Christian victory of the Re-Conquest (see SPAIN, History) was achieved. C. has many Rom. remains. Pop. 11,000.

Cange, Charles Dufresne, Sieur du, see DU CANGE.

Cango, dist. of S. Africa, about 17 m. N. of Oudtshoorn. It is famous for the magnificent caves, where some of the finest stalactites in the world are to be seen. They were discovered in 1780, and are said to have inspired Rider Haggard's *King Solomon's Mines*. The explored section extends for 2 m.

Canicattì, tn in Sicily (q.v.), 15 m. ENE. of Agrigento (q.v.). It is in a sulphur-mining region. Pop. 31,100.

Canicular Days, see DOG-DAYS.

Canidae, dog family, which includes wolves, foxes, jackals, etc., constitutes the group Cynoidea of the Carnivora, and is placed between the cats and the bears. All the members of the family are carnivorous, but some will eat vegetables and insects as well. They are cosmopolitan and nearly always hunt in packs; they are found abundantly in fossil state with many extinct species. The number of teeth varies in the genera, but the commonest form is that with 42-3 incisors, 1 canine, and 4 premolars on each side of the upper and lower jaw, with 2 or 3 molars on each side of the upper, 3 on the lower jaw. The origin of the domestic dog is unknown, but it may have come from the wolf. Wild dogs abound in S. America, among them *Cerdocyon thous*, the crab-eating dog. *Vulpes vulpes* is the common fox, *Alopex lagopus* the Arctic fox, *Canis dingo* the dingo, *C. lupus* the wolf, *C. aureus* the jackal, *C. latrans* the prairie wolf; *Speothos venaticus* is the bush-dog; *Otocyon megalotis* is a solitary African species; *Lycan pictus* is the Cape hunting-dog. (See photograph, page 44.)

Canigou, The, mt of France, at the extremity of one of the lateral chains of the oriental Pyrenées. It is clothed with vegetation almost to its summit. Height 8555 ft.

Canis Major, or Orion's Dog, constellation of the S. hemisphere, S. of Orion. Its chief star is Sirius, by which the constellation may easily be found, this star being on the extension of the line through Orion's belt.

Canis Minor, constellation of the N. hemisphere, N. of Canis Major and E. of Orion. Its brightest star α (see PROCYON)

lies nearly on the line between Sirius and Pollux, and almost midway between the 2 stars.

Canister Shot, see **CASE SHOT**.

Canitz, Friedrich Rudolf Ludwig, Freiherr von (1654-89), Ger. poet, b. Berlin. He held the highest state offices under the great electors. He wrote many satirical poems in the style of Boileau, which were not pub., however, till a year after his death.

Canker, name of a plant disease which attacks fruit trees, such as the apple, and sometimes forest trees, as the larch. It may usually be found to be present when the bark begins to split, or when the ripe fungus protrudes from the wounded

posterior stamen of the inner whorl bears a bilocular anther on its edge; of the petaloid structures, the *staminodia*, one is larger, turns back on itself, and is known as the *labellum*. The gynaeceum is inferior and consists of 3 carpels which are trilocular, have a petaloid style, and contain numerous ovules. Nearly all the species of *Canna* have a great deal of starch in their rhizomes, and *Canna Starch* ('Tous les mois') is made from *C. edulis*. This plant has large, tuberous roots, smooth leaves, and stems coloured at the base.

Cannae, anct city of Apulia (q.v.), Italy, near the mouth of the Aufidus (now Ofanto). To-day it is called Canne, near



CRAB-EATING DOG

bark. Many varieties of low plants may cause the disease, but the ones to which most importance is attached are the fungi *Dasyascypha calycina*, causing larch C., and *Nectria galligena* (not *N. dilissima* as was formerly supposed), producing C. of apple and pear. The best methods of curing the tree of C. are to cut off the diseased branches or to cut out the affected parts, and to smear over the wound with an impermeable substance. Some varieties of apples, e.g. Bramley's Seedling and Newton Wonder, are much more resistant than others such as Cox's Orange Pippin; resistance also varies with the dist. and the type of soil.

Cannore, Malcolm, see **MALCOLM III.**

Cannabis Sativa, see **HEMP**.

Cannaceae, monocotyledonous family of a single genus of plants, all of which are tropical or subtropical. *Canna indica* (Indian shot) is a handsome ornamental plant often cultivated on account of its appearance. The inflorescence is terminal, the flowers are hermaphrodite, asymmetric, and epigynous, with 3 free sepals and 3 united petals; the fruit is a capsule. The androecium is represented by a number of petaloid bodies in which the

Barletta (q.v.). Here in 216 BC Hannibal (q.v.) inflicted a crushing defeat on the Romans.

Cannan, Gilbert (1884-), novelist and playwright, b. Manchester. He was called to the Bar in 1908 after graduating at Cambridge, and also worked as dramatic critic. His first novel, *Peter Homunculus*, 1909, was followed by a number of others, including *Young Earnest*, 1915, *Three Pretty Men*, 1916, and *The Stucco House*, 1917, which estab. his reputation as a writer of the realistic and psychoanalytic school. His plays include *Miles Dixon*, 1910, *James and John*, 1911, *Mary's Wedding*, 1912, *The Perfect Widow*, 1912, *Wedding Presents*, 1912, and *The Arbour of Refuge*, 1913. He has also written books and essays on social and literary subjects, and was the translator of Romain Rolland's *Jean Christophe* in 4 vols., 1910-13.

Cannanore, tn on Malabar coast, in Madras state, India. It is a port of call for coastal trading vessels. It was once Portuguese ter. and the fort (AD 1505) still stands on the cliffs.

Cannel Coal, coal containing an unusual amount of ash and volatile ingredients,

and burning with a clear, candle-like flame. Valuable as a source of gas and oil. *See* COAL.

Cannes, resort on the Fr. Riviera (q.v.), in the dept of Alpes-Maritimes, 13 m. SW. of Nice (q.v.). It is beautifully situated on the Bay of La Napoule. In Rom. times it was on the Aurelian Way (q.v.), but it was nothing more than a fishing vil. until the middle of the 19th cent. Its reputation as a winter resort began when Lord Brougham (q.v.), who had been detained in C. in 1834 by an outbreak of cholera in Savoy, built a villa, and his example was soon followed by others who were attracted by the mildness of the winter climate and the temperate heat of the summer. On the N. the tn is sheltered from the mistral (q.v.) by low, wooded hills, on which there are numerous hotels and villas. The tn itself extends in a crescent along the Rade de Cannes, and has fine gardens and boulevards, as well as casinos, baths, and sporting facilities. On the Mont Chevalier, beside the harbour, is a 16th-17th-cent. church and a watch tower (1070-1305), built by the monks of the nearby Lérins Is. (q.v.). Fruit and flowers are grown, and there is a trade in olive oil, soap, and fish. Pop. 50,200. *See* CANNES CONFERENCE.

Cannibalism, or **Anthropophagy** (Gk *anthrōpos*, man; *phagēin*, to eat) the practice of eating human flesh. The word is a variant form of Carib, a fierce man-eating tribe of the W. Indies. Caliban is probably another variant. C. has, at some time or other, existed in almost every part of the globe. Strabo asserted that C. existed in Ireland, and the authority that the practice once prevailed in Scotland is St Jerome. As late as 1782 gipsies were executed in Hungary for practising C. It is still known among the tribes of W. and Central Africa, New Guinea, and Melanesia. C. may often be traced to an economic cause. Even among modern civilised races it has been resorted to in cases of dire necessity, such as siege, famine, shipwreck, etc. Savage tribes may be prompted by hunger to eat men when the flesh of animals is not available. Among certain African tribes, the Azande and Mangbetu, human flesh was formerly sold in the market-places, and corpses of relatives were eaten. A S. Amer. tribe used to breed from their captive women, in order to procure a constant supply of human flesh. Higher motives for C. are religious. It was thought that a man acquired the qualities of the thing he ate. Thus the heart of a lion consumed by a chief would make him valiant, and a man would eat his enemy in the hopes of acquiring his courage or perseverance. This motive for C. existed among the Issedones of Central Asia, mentioned by Herodotus (iv. 26). The Maoris, Australians, and Indians of N. America believed in the transmigration of souls. The eating of the enemy might, therefore, prevent his spirit finding another resting-place and would secure the murderer against being haunted by the ghost. In Australia certain tribes felt that the most fitting burial place for the

deceased was within their living relatives. Such funeral feasts were attended by many religious rites. Among the anc. Mexicans and the natives of Fiji human flesh was regarded as the only fit offering to the gods, and the victims thus offered were often devoured by the onlookers. Another ritual motive for C. existed among the 'Hametzen', 'magicians of NW. America, whose rule it was to eat human flesh for admittance to their order.

Canning, Charles John, Earl (1812-62), statesman, Governor-General of India during the mutiny of 1857. He was the son of George C., was educ. at Eton and at Christ Church, Oxford, and entered the House of Commons in 1836. Under Peel's administration C. was under-secretary of state and postmaster-general, 1853-5. In 1856 he became Governor-General of India, and when the mutiny broke out his strong moral qualities, good administrative ability, and clear judgment enabled him to deal with the situation in a masterly way, little expected of him by many who felt that his powers were not equal to the occasion. His policy of conciliation towards the native princes and his devotion to the work of reform and development of the country stood him in good stead in a difficult position. He became first viceroy of India in 1858 and was made an earl in 1859. *See* life by H. S. Cunningham, 1891.

Canning, Elizabeth (1734-73), criminal around whose case raged excitement and controversy, into which Fielding entered with his *Clear State of the Case of Elizabeth Canning*, 1753. She told a mysterious tale of detention in the house of a 'Mother Wells.' Her story led to a condemnation, but on its being afterwards proved to be false she herself was transported.

Canning, George (1770-1827), statesman, b. London, educ. at Eton and Christ Church, Oxford, and entered Parliament as a Tory in 1794. A couple of years after he took his seat Pitt made him under-secretary for foreign affairs, and promoted him to the office of commissioner of the Board of Control (1799), and then to paymaster-general (1800). When Pitt resigned in 1801 C. did not join the Addington administration, towards which, although nominally a supporter, he acted the role of 'candid friend.' When Pitt returned to office in 1804, C. became treasurer of the navy; and, on the death of his leader 2 years later, he declined to serve in the Cabinet of 'all the talents.' He became foreign secretary under Portland in 1807, but his disagreement with Castlereagh's (q.v.) conduct of the war, as war-minister, led to a duel between the 2 men (1809). Both ministers subsequently resigned; but in 1816 C. went to the India Office under Lord Liverpool. As a supporter of Queen Caroline he declined to take any part in the proceedings against her in 1820, and tendered his resignation, which was eventually accepted (1821). The following year he accepted the appointment of Governor-General of India, but on the eve of his departure Castlereagh committed suicide, and he stayed at home, going again to

the foreign office. In 1827 C. became prime minister and chancellor of the exchequer, but d. 4 months after taking office. C. had literary as well as political interests, and in 1797-8 he printed many pieces in the *Anti-Jacobin* (q.v.), including the well-known *Needy Knife-grinder*. His poems were collected in 1823. His foreign policy was fundamentally a continuation of that of his rival, Castlereagh; but he was ready to intervene in Europe whenever intervention by other powers threatened Brit. interests, as in Portugal, 1825 and 1827. C. was more liberal in his views on domestic policy than most of his colleagues in Liverpool's gov.; but was



GEORGE CANNING
After Gainsborough.

opposed to parl. reform. He was, however, consistently in favour of Catholic Emancipation. As an orator, for excellence of phrasing, for admirable delivery, and for sound common sense, he has had few rivals. His speeches were pub. in 1828. See also J. A. R. Marriott, *George Canning and his Times*, 1903; H. W. V. Temperley, *Life of Canning*, 1905, and *The Foreign Policy of Canning*, 1925; and a life by Sir C. Petrie, 1930.

Canning, Sir Samuel (1823-1908), engineer and one of the pioneers of submarine telegraphy. His first cable was the one connecting Cape Breton Is. with Newfoundland; then he assisted in laying the first Atlantic cable. He laid the Atlantic cable of 1865-6, inventing the grappling machinery for recovering the

Canning, process of preserving meat, fish, fruit, etc., by sealing up in cans or tins. The principle upon which this process is based is that of excluding the air from the produce it is desired to preserve. Before C. was thought of, many

methods of covering the cooked food with an air-tight coating were experimented with. These all failed for the reason that, although the air was thereby excluded, the germs contained in the air were not; these were imprisoned in the food and caused putrefaction. In C. the air is expelled and the germs killed at one and the same time by subjection to intense heat. Removal of oxygen may also be secured by exposure under pressure to an inert gas, such as nitrogen. The meat or other food is packed in cans, which are then either placed in a steam oven, immersed in boiling water, or stood in a vat partially filled with a solution of calcium chloride and water, and then subjected to a heat of 270° F., for a length of time that varies according to the character of the food. Thus the germs and spores are destroyed; air and steam escape through a pin-hole which has been left in each can. The holes are then soldered up and the tins allowed to cool. Food thus preserved should, if the process has been perfectly carried out, remain in good condition. Experiments have proved that even after 20 years there is no sign of deterioration. This could occur only if the process were not thorough, and the presence of putrefaction could be detected by a bulging of the can due to gases developed in the course of decomposition. C. was probably invented by M. Appert of Paris about 1810, but many others made experiments in the same direction. The 20th cent. has seen an enormous increase, not only in the variety of foods to be canned, but also in the quantity produced. Now canned meats, fish, soups, fruits, and vegetables of all kinds can be obtained at all seasons of the year, all over the world, the diet of each individual country being thus greatly extended. The U.S.A. still leads, as it always has done, in the canned foods industry, but the Brit. dominions are a formidable rival. In Great Britain itself the trade has increased, as it has in Norway, Spain, Portugal, Italy, and other European countries, in Japan and in the Malay States, where pineapple canneries have been started. The past 20 years especially have seen a considerable development of the C. industry in the U.K., and there are now a large number of factories for canning fruit and vegetables. The Campden Fruit and Vegetable Preservation Research Station attached to Bristol Univ. gives useful scientific advice to the industry. See T. E. Bashford, *Hygiene and Canning Practice* (pamphlet, Metal Box Co.), 1951; R. Taggart and F. D. Farrow, *Heat Penetration into Canned Foods* (pamphlet, Metal Box Co.), 1951; J. L. Rogers, *A Course in Canning*, 1952.

lost cable of an unsuccessful first attempt.

Canning Town, industrial dist. of E. of London, in the bor. of West Ham, Essex, in which are situated the extensive Victoria and Albert docks.

Cannock, urb. dist. of Staffs, England. C. forms the centre of the C. Chase coal-field, and includes tracts of woodlands and common land suggested as

part of a conservation area. The prin. industries are mining, edge tools, brick and tile making, and light engineering. Its pop. has increased from 2099 in 1851, to 41,030 (estimated) in 1952.

Cannon, see GUN.

Cannon-ball Tree (*Couroupita guianensis*), family Lecythidaceae, a tall soft-wooded tropical Amer. tree. The fruit is a large, round, woody capsule, and this has earned for the plant its popular name.

Cannstadt, Bad, Ger. tn in the *Land of Baden-Württemberg* (q.v.), on the Neckar. It is a NE. suburb of Stuttgart (q.v.). It has noted mineral springs, thought to have been known to the Romans, and has machinery manufs., foundries, and brick works. Moreau defeated the Archduke Charles (qq.v.) near by in 1796.

Cano, Alonzo (1601-67), Sp. painter, sculptor, and architect, b. Granada. He studied painting under Francisco Pacheco, the master of Velazquez, and sculpture under Juan Martinez Montañes. In 1637 in consequence of a duel, he was obliged to flee from Seville to Madrid, where he was befriended by Velazquez. Through the influence of his fellow artist, he was appointed court painter and royal architect but, again in trouble, fled in 1652 and d. at Granada. C. excelled in the 3 arts, and on account of the universality of his genius was called the Michelangelo of Spain. He executed 2 colossal statues of St Peter and St Paul. There are beautiful specimens of his work in the cathedral of Granada, and in the Prado, Madrid.

Cano, Juan Sebastian del (d. 1526), Sp. navigator. He sailed under Magellan, who was killed in the Philippines. C. continued the voyage, doubled the Cape of Good Hope, and landed near Seville in 1522, being the first to circumnavigate the world. Charles V gave him a pension and a globe inscribed with the motto *Primus me circumdedit*.

Canoe (from a Caribbean word through the Sp. *canoa*), a boat having both ends pointed and propelled by paddles with or without sail assistance. Primitive C.s used by anc. Britons and N. Amer. Indians were made of hollowed tree trunks; many of these 'dug-out' craft have been unearthed in the Brit. Is., and they are still used by natives of Africa and S. America. C.s used by Eskimos are known as kayaks and originally consisted of seal skins stretched over a framework of reindeer bones. C.s have been made of paper, tin, aluminium, inflatable rubber, and glass fibre. Modern C.s are either rigid or collapsible (folding), varying in length from 8 to 18 ft and being single- or double-seaters, generally with decks of wood or canvas. Rigid C.s are constructed of oak, cedar, or pine (but Amer. C.s may be of cedar, mahogany, or bass-wood), or on the lines of the Indian birch bark C. The 'Canadian,' heavy and expensive but long-lasting, is an open type of rigid C. with upturned ends. Its hull can be made in sev. ways, for instance with narrow planks placed flush and strengthened by laterally fixed light ribs. Folding C.s have rubberised hulls, canvas

decks, and lightweight framework of ash rods and cross-pieces with brass fittings. They weigh between 40 and 60 lb. and can be assembled or dismantled in 20 minutes, being carried in 2 canvas bags. Such craft shoot rough rapids and seldom capsize owing to their low centre of gravity. They are ideal for sea canoeing, having been paddled numerous times across the Eng. Channel, and twice (1928 and 1957) sailed across the Atlantic Ocean. Enemy coasts were reconnoitred with them, sometimes operating from submarines, in the Second World War, and many took part in Commando raids. Their peace-time uses include survey work and bridge inspection. Sport canoeing began about 1866 when John MacGregor founded the Royal C. Club. To-day more than 50 clubs are active in Britain, the largest being the C.-Camping Club, 35 Old Kent Rd., London, S.E.1. MacGregor toured extensively in Europe and his *Rob Roy* books describe his adventures with a 14-ft cedar-decked craft built of oak and fitted with sails, dyed blue to counteract the sun's glare. Other pioneers of C. cruising were W. Baden-Powell who wrote *Canoe Travelling*, 1871; Wm Bliss, 1865-1949, author of *Canoeing, Rapid Rivers, and Heart of England by Waterway*; and R. Raven-Hart, whose 7 books cover his 15,000 m. canoeing since the First World War, including voyages down the Mississippi and Irawadi R.s., and an Australian cruise. C.s figure in the Olympic Games, while sev. countries, e.g. France, Spain, S. Africa, U.S.A., and Great Britain, hold C. races either on smooth water or along fast rivs. For safety C.s should be fitted with bladders and paddlers must wear life-jackets in difficult water. Since 1934 slalom competitions have taken place and Brit. clubs organise a dozen each summer. In these, C.s are paddled over a stretch of riv. having natural hazards (weirs, rapids, rocks) or artificial obstacles (poles or staves hanging from ropes to form 'gates') which must be negotiated. See Noel McNaught, *The Canoeing Manual*, 1956.

Canon (Gk *kanōn*, a straight rod, hence measuring rod or rule; metaphorically anything which regulates or keeps straight), term used in a number of special senses. (1) In the early Church, a rule of faith. By the 4th cent. it had come to mean the rules of faith and practice laid down by Church councils (q.v.). (2) The list of saints honoured by the Church. (3) The central and essential portion of the Rom. Mass and Oriental Liturgy. (4) Member of a religious order or congregation. The institution of bodies of clergy, known as C.s, living a common life under no very clearly defined rule dates from early times. In the early part of the 4th cent. the clergy at Vercelli were so united, and St Augustine of Hippo also followed this system in the following cent. At the Lateran at Rome there was another early foundation of the same kind. The practice became more general in the 8th cent., when Chrodegang, Bishop of Metz (742-66), drew up a definite rule for C.s, founded largely on the Benedictine

rule, but owing something to the traditional rule of the Lateran. In 816-17 Louis le Débonnaire made this rule binding on all C.s throughout the empire. In course of time the institution deteriorated, and a distinction between C.s regular and C.s secular was made. The former observed the rule, while the latter, frequently laymen, were mainly administrative dignitaries. Various attempts were made at reform, notably by the papal synods of 1059 and 1063. These councils insisted on the original plan of the common life, and also urged the necessity of poverty, for canonries were often considered merely as lucrative sinecures. A new rule, founded chiefly on the writings of St Augustine, was now made, and those observing it were known as Augustinian C.s. There were over 200 houses of Augustinian C.s in England at the Reformation. Since that date few attempts have been made to improve the system of C.s regular. The chief orders of the kind in the Rom. Catholic Church are those of the Lateran and the Premonstratensians. Many foundations were entirely abolished at the Reformation. (5) In both the Rom. Catholic and Anglican Churches the title C. is also used for those clergy who are connected with cathedral churches, and form the cathedral chapter.

Scriptures. The C. of the O.T. and N.T. comprises those books which are held to be authoritative and of divine inspiration. See **BIBLE**.

Music. A C. is a form of composition, based on rule and written in strict imitation. The introductory theme or melody is taken up and repeated note for note in succession while the other part or parts continues. The entries may be on the same or different degrees of the scale. This kind of composition was introduced about the 12th cent., and like the fugue is one of the difficult problems in the art of musical composition.

Canon Law, body of laws enacted at various times by eccles. authority for the gov. of the Church. It was not until the 6th cent. that the Church possessed a code of eccles. law; but at that date she began to use a collection of canons compiled by Denys the Little, a Scythian monk who also fixed the beginning of the Christian era. Later, Charlemagne prescribed a more elaborate corpus, known as 'Hispana' because it originated in Spain. Next we have the celebrated forgery known as the 'False Decretals' (see **ISIDORIAN DECRETALS**), which attributed to former popes a number of decisions and decrees which, though spurious, reveal no small degree of wisdom. In the middle of the 11th cent. the Church determined to systematise her legal text-books, and a start was made by Fr. canonists, notably by Yves of Chartres. But their work was quickly superseded by that of Gratian, the great master of Bologna Univ., who in 1152 pub. his *Concordia discordantium canonum*, a regular treatise of canonical lore, which completed, corrected, and pruned the auct. corpus. Though not official in the strict sense of the word, Gratian's work

became a classic in the schools and was adopted in the courts. Roland Baudinelli (afterwards Pope Alexander III) enlarged the *Concordia*; but it was Innocent III who brought the C. L. under papal supervision by appointing a commission of notaries to revise Gratian. They added sev. more canons and decretals, and presented the result of their labours to Bologna Univ. The new pub., however, was both diffuse and defective. About 1230, therefore, Gregory IX instructed his chaplain, St Raymond of Pennafort, to draw up a systematic code of C. L. This epoch-making work, entitled *Quinque Libri Gregorii IX*, was pub. in 1234; it was adopted by the whole church, and received no additions until the *Liber Sextus* of Boniface VIII. The *Clementines* of Clement V were pub. by John XXII in 1317. These 3 works, forming the *Corpus Juris Canonici* continued to represent the Church's laws down to the promulgation of the present *Codex Juris Canonici* by Benedict XV in 1917. The latter, a masterpiece of codification, was prepared under the direction of Cardinal Gasparri, and is binding upon the whole Rom. Catholic Church. It may not be trans. into vernacular without permission of the Holy See, and in no case has this yet been granted. See the Introduction (Lat.) to the *Codex Juris Canonici*; article in *The Catholic Encyclopedia*; C. Bachofer, *Commentary on the New Code of Canon Law*, 1938; S. Woywod, *Practical Commentary on the Code of Canon Law*, 1949.

Canon Law in the Church of England. By the Act of Submission of the Clergy (1534) provision was made for a commission to survey the canon law (q.v.), which was meanwhile to remain in force, except in so far as it conflicted with the royal pretensions or with the alleged customs and laws of the realm. Failure to implement this provision led to much uncertainty as to which parts of the *Corpus Juris Canonici* were to be recognised in England. The Act of 1534, however, had empowered the convocations to make new canons, subject to the king's assent; and in 1604 James I authorised 141 canons made by the convocation of Canterbury, which were held by Coke to bind the clergy alone. In the meantime, Thomas Cromwell had prejudiced the study of canon law by ordering the univs. in 1535 to substitute lectures in civil law for those in canon law; while in 1540 Henry VIII founded regius professorships in civil law at Oxford and Cambridge. Further, by an act of 1545, laymen who were doctors of civil law only were permitted to serve as judges in the eccles. courts. This marked the victory of civil over canon law; and although Doctors' Commons continued until 1857 as a centre for lawyers learned in canon law, both the eccles. law and the Church courts gradually fell into abeyance, especially after the toleration act of 1689. A commission under the Archbishop of York was appointed in 1939 to prepare a revised body of canons. Its report, pub. on 16 May 1947, did not

presuppose a return to the auct authority of canon law, but merely aimed at restoring among the clergy and laity of the estab. Church an agreed body of eccles. rules to form the basis of consensual obedience. These proposals were not carried into effect. See E. Kemp, *An Introduction to Canon Law in the Church of England*, 1957.

Canonbury, dist. of London, in the bor. of Islington. C. Tower (c. 1530), in C. Place, is a relic of the country residence of the priors of St Bartholomew, Smithfield.

Canonesses, associations of women first instituted in the Frankish empire during the 8th cent., in imitation of the early groups of canons (see CANON (4)). The members were generally ladies of high birth, living under a rule which imposed vows of chastity and obedience, but not the vow of poverty. They observed the common life and were bound to recite the divine office (see BREVARY), but were not enclosed. C. devoted themselves mainly to educational work, teaching the embroidery of vestments and the transcription of liturgical books. As with the canons, a distinction was later drawn between regular and secular C. The present C. of the Holy Sepulchre are an enclosed order of nuns; they have 1 house (with school) in England, at New Hall near Chelmsford, Essex.

Canonical Hours, certain hours appointed by the Rom. Catholic Church for the celebration of divine office the sev. parts of which (see BREVARY) came thence to be known as C. H.

Canonisation, recognition on earth of a departed Christian as a saint in heaven, originally by the inclusion of the person's name in the list of saints commemorated in the Eucharistic Canon. In the earliest ages there was no other formal act of C., as it was only in their own locality that martyrs were venerated. The fact that a person was a saint was largely estab. by the opinion of the Christian community where he had lived, and by the growth of a spontaneous local *cultus* (see below). During the early Middle Ages, it rested with each bishop to decide which saints should be honoured in his diocese, and on what day. However, much carelessness crept in, and sev. scandals arose from the 7th to the 10th cents., men of evil life being inscribed among the saints. The policy of centralisation also tended to bring the act of C. under the papal power. The earliest known case of C. by the Pope is that of Ulric of Augsburg by John XV in 993. At the end of the 12th cent., by decrees of Alexander III (1170) and Innocent III (1200), the right was exclusively reserved to the Rom. Court. This rule was made more stringent by Urban VIII in 2 constitutions (1625 and 1634), and the procedure of the process was then laid down. With slight modifications it is in force at the present day. It was strictly forbidden publicly to venerate in any fashion any person not papally canonised. Two exceptions were made, those who had received immemorial *cultus*, and those whose *cultus* had been

sanctioned by preceding popes. Those falling in either of these classes receive what is known as *equipollent* C. The procedure of formal C. is as follows: Fifty years must normally elapse after the death of the candidate. A court is then instituted by the ordinary of the dist. where the claim is made, and material is gathered on which the case may be judged. The materials are then sent on to the Congregation of Rites at Rome, and after a lapse of 10 years the case is *introduced*. The promoters of the cause are opposed by an '*advocatus diaboli*.' If they are successful, the claimant may now be called *Venerable*. After proof of 2 miracles performed at the candidate's intercession, and also of the candidate's possession of Christian virtues in a heroic degree, the *beatification* (q.v.) is performed. After the proof of 2 more miracles since beatification, the Pope then proceeds to canonise the *Beatus*. Finally there is a solemn mass of the new saint in St Peter's, preceded by a reading of the bull of C. The Orthodox Eastern Church makes no distinction between beatification and C. There are a number of persons long recognised and celebrated as saints by the general consciousness of the faithful (clergy and laity). Apart from these, claims to sanctity are examined and verified by a synod of all the metropolitans, archbishops, bishops, and clergy of the particular church. The life, orthodoxy, and miracles of the proposed saint are closely scrutinized. A deed of proclamation is then signed by the whole synod at a special service in the church. A liturgical proper of the saint is later drawn up, and the relics (if any) are trans. and anointed with Holy Chrism. In the Anglican Church no new saints have been canonised since the Reformation, though Rom. Catholic and Orthodox C.s since then have been widely recognised.

Canons, Books of, in Scottish eccles. law, a body of constitutions for the regulation of the Church in Scotland prepared by the bishops of that country and confirmed by letters patent under the Great Seal in 1635, after they had been revised by Laud. In the next year they were pub. at Aberdeen, and caused discontent throughout the country on account of the stringency of their regulations. The king's supremacy in matters eccles. was emphasised.

Canonsburg, bor. of Pennsylvania, U.S.A., near Pittsburgh. It is a bituminous coal-mining centre, and manufs. tin plate, steel, and metal products; other products are gas, oil, fruit, grain, and potatoes. Pop. 12,070.

Canopic Jars, so called because of the legend that Canopus, a pilot of Menelaus, buried at Canopus in Egypt, was worshipped in the form of a jar. C. J. were used to hold the viscera of mummified bodies. In sets of four and usually made of stone, they had lids shaped, at first, like human heads (Middle Kingdom) and later with heads of the animal forms of the 4 'Children of Horus' (man, baboon, dog, and hawk).

Canoppi, Antonio (1773-1832), It. artist. He was first engaged as a fresco-painter by various It. nobles; later he became a scene-painter at the Fenice Theatre, Venice, and afterwards at Mantua. In Moscow, where he sought refuge during the Napoleonic wars, he decorated the hall of the senate and other public buildings, but his work was destroyed in the great fire of 1812. In 1811 he went to St Petersburg, where he remained till his death. At the Imperial Theatre he executed a number of architectural scenes, including those for the operas of the *Zauberflöte* and *Semiramis*, which excited the highest admiration. Author of *Opinion d'Antoine Canoppi sur l'architecture en général et en spécialité sur la construction des théâtres modernes*, 1830.

Canopus, anct port of Egypt, near modern Aboukir, 14 m. E. of Alexandria, on W. mouth of the Nile, called after it the Canopic mouth. C. was a pleasure resort of the anct Alexandrians. Site of the famous temple of Serapis (q.v.). See also CANOPIC JARS.

Canopus, second brightest star (magnitude - 0.9) in the heavens, situated in the constellation Carina, which is one of the 4 constellations composing the former constellation Argo. It is extremely remote, probably 470 light-years away, and of enormous luminosity. Proper motion 2" per century.

'**Canopus**,' name of a first-class Brit. battleship of 1897 class, launched in 1898 and of 12,950 tons burthen. Just after outbreak of First World War this ship joined Adm. Craddock's squadron. Owing to its being old and slow, Craddock did not bring it into action at the battle of Coronel (1 Nov. 1914). After the battle she escaped to the Falkland Is., and fired the first round when Adm. Sturdee sank Von Spee's fleet on 8 Dec. 1914. The name was first used in the R.N. in 1798, and was associated with the engagement off San Domingo, 1806, and the passage through the Dardanelles, 1807.

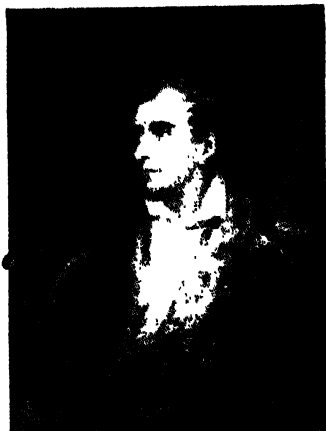
Canopy (Gk *κονόπετον*, from *κόνος*, a gnat; Lat. *canopium*). The word was used by Herodotus (book ii) in speaking of the nets with which the Nile fishermen protected themselves from mosquitoes. Hence it is used for a covering, but in particular for one suspended over a bed or throne, or over a coach in state processions. In architecture the word denotes the projection over an altar, tomb, or niche, especially as a feature in Gothic architecture. A modern flat C. over the entrance to a theatre, hotel, etc., is called a 'marquise.' See BALDACHIN.

Canosa di Puglia, It. tn, in Apulia (q.v.), 43 m. W. of Bari (q.v.). It occupies the site of the anct *Canusium*, and has Rom. remains, including a ruined amphitheatre. Outside the cathedral (partly 11th cent.) is the tomb of Bohemund I (q.v.). There is a trade in agric. produce. Pop. 33,800.

Canossa, It. vil., in Emilia-Romagna (q.v.), 12 m. SW. of Reggio nell'Emilia (q.v.). The ruins remain of the castle where, in Jan. 1077, the Emperor Henry IV (q.v.) humiliated himself before Pope Gregory VII. This event is the origin of

the phrase 'to go to Canossa,' i.e. to humiliate oneself before a person whom one has previously resisted.

Canova, Antonio (1757-1822), It. sculptor and painter, b. Possagno, Treviso. He came of a family of stone-cutters, and at 14 entered the atelier of the sculptor Torretti, through the help of his patron, Giovanni Falieri, a Venetian senator. C. accompanied his master to Venice, and, after Torretti's death, studied under his nephew Ferrari and at the Venetian Academy. At 15 C. worked on a group, 'Orpheus and Eurydice,' and at 22 had finished his famous 'Daedalus and Icarus,' now in the Venetian Academy. In



CANOVA

An engraving from a painting by Sir T. Lawrence.

1779, through the influence of his friend Falieri, C. was awarded a pension by the Venetian Gov. In 1780 he went to Rome to study, and sought (like Flaxman and Thorwaldsen, q.v.) to create a new and purified classicism. He exhibited in 1782. Before long he was acknowledged as the first sculptor of his day. C. was 3 times summoned to Paris by Napoleon. He carved the well-known bust of Napoleon in the Pitti Palace, and also Pauline Borghese as a reclining Venus, and the Empress Maria Louisa as Concordia. C. also executed many commissions for the Pope, on whose account he suffered exile during the revolution of 1798-1800. He visited England, 1815, and expressed regard for Haydon (q.v.), especially for his championship of the Elgin Marbles. In 1816 he was created Marquess of Ischia, and his name was inscribed in the Golden Book of the Capitol. He died at Venice, and was buried in the church he himself built at his bp. His famous 'Cupid and Psyche' is in the Louvre. Among his other well-known pieces are 'Hercules throwing Lichas into the Sea,' 'Perseus,'

'Venus and Adonis,' 'Hebe pouring Nectar,' 'Theseus and the Centaur,' and 'Mars and Venus.' See lives by Quatremère de Quincy, 1834, and A. G. Meyer, 1898.

Cánovas del Castillo, Antonio (1828-1897), Sp. statesman and historian, b. at Málaga. He became a member of the Cortes in 1852 as leader of the Conservatives, was Premier 1875-81, and held this office 6 times at intervals up to 1897. C. was a member of the Sp. Academy from 1867 till his death. He ed. and directed the pub. of *Historia General de España*. He was assassinated by an anarchist at Santa Agnada.

Canrobert, François Certain (1809-95), marshal of France, b. St Céré. He first became noted through his valour, displayed in the Algerian wars of 1835 and 1841-51. He also rendered Louis Napoleon great service in his *coup d'état* of 1851. When the Crimean War broke out he was given command of the 1st div. of the Fr. Army, but on the death of Marshal Saint-Arnaud he was made commander-in-chief. Although twice wounded, he completed the lines of investment at Sevastopol. He resigned his command in May 1855 through a disagreement with Lord Raglan. He fought at Magenta and Solferino in the It. wars in 1859, and in the Franco-Ger. war, 1870. He was besieged at Metz, but had to surrender, and was thereupon imprisoned in Germany.

Canso: 1. Cape in Nova Scotia, on the N.E. extremity, and on the S. side of Chedabucto Bay.

2. Gut or strait, 17 m. long, 2½ m. wide, between Nova Scotia and Cape Breton Is. In 1955 a causeway 4500 ft long and 80 ft wide was opened linking Cape Breton Is. to the mainland by highway and railway.

Cant, Andrew (1590-1663), Scottish preacher and leader of the Covenanters. He became minister of Pitsligo in Aberdeenshire in 1633; of Newbattle, Midlothian, in 1638; and of Aberdeen in 1640. In July 1638 he was made a commissioner for the purpose of converting people to Presbyterianism, and in the same year he took an active part in the celebrated assembly which was held at Glasgow.

Cant, in architecture, an external angle cut off obliquely; apparently synonymous with 'bevel,' 'chamfer,' and 'splay'—terms generally applied only to small details in building. It is also applied to a ship's timber, forward or aft, lying obliquely to the keel.

Cantabri, ancient race of mountaineers living in the N. of Spain. The Bay of Biscay was named after them by the Romans, *Sinus Cantabrigus*. The Basques (q.v.) of the Pyrenees sometimes claim the C. as their ancestors. The Cantabrian war, between the C. and the Romans, lasted for 6 years (25-19 bc), and was finally concluded by Agrippa (q.v.). Although Rom. garrisons were stationed in their country, the C. continued to assert their independence.

Cantabrian Mountains, range of mts in N. Spain, continuing the line of the Pyrenees W. for about 300 m., parallel to the coast of the Bay of Biscay.

Cantacuzenus, Byzantine family, some of whose members became very influential at court and aspired to the imperial throne. 1. John C. (c. 1292-c. 1380), Byzantine soldier and historian, b. Constantinople. He was chief adviser to Andronicus III (1328-41), who left him as guardian and regent to his son, John V, then a boy of 9. C. was suspected by the queen-mother, fled from Constantinople, and proclaimed himself emperor as John VI. He was the effective ruler from 1347 to 1355, and his daughter married John V. But in 1355 he was forced to abdicate. He was responsible for seeking help from the Ottoman Turks, thus giving them an entry into Europe.

2. Matthias (d. 1383), his son, waged war for 2 years, after his father's retirement, against John V, but was unable to make himself effective emperor.

Cantal, central dept of France, in the S. part of the old prov. of Auvergne. The region is occupied by an extinct volcanic mass, the highest peaks being Plomb de Cantal (6095 ft) and Puy Mary (5850 ft). Cattle are bred, and part of the country makes good arable land. Rye, potatoes, and chestnuts are the chief products. The only 2 rivs. of any importance are the Truyère and the Dordogne. The prin. tns are Aurillac (the cap.), Mauriac, and St-Flour (qq.v.). Area 2229 sq. m.; pop. 177,100.

Cantaloupe, small, round, ribbed musk melon; so called from the castle of Cantalupo in the Marca d'Ancona, Italy. The word is much used in the U.S.A. and in Canada, where it is applied to a variety of edible melon much grown in those countries and marketed in great quantities.

Cantarini, Simone (1612-48), It. painter, called Pesarese, or Simone da Pesaro, b. Orpezza, near Pesaro. He was first a disciple of Pandolfi and Claudio Ridolfi, and afterwards of Guido Reni, whose style he approached very nearly. He painted the portrait of the Duke of Mantua, but was mortified at the result, and died, possibly of poisoning, at Verona. C. was a good colourist, but his work lacked character and originality. His best-known paintings are a portrait of Guido in Pesaro, the 'Assumption' in the Bologna Gallery, 'St Thomas placing his fingers in the side of Christ' at Naples, and 'Joseph and Potiphar's Wife' in the Dresden Gallery.

Cantata (Lat. *cantare*, to sing), in music, term applied to certain forms of composition for solo voices and chorus, with instrumental accompaniments, sacred or secular in character. In the former case it resembles an oratorio, but is shorter; in the latter it may be compared to an opera, but it has no stage accessories. Originally a C. was a composition sung by 1 person to a single instrument.

Canteen, refreshment room provided in a barracks, camp, on a ship, in a factory, office, shop, or other premises for the use of persons serving or employed therein. In the Brit. armed forces C.s provide service personnel with facilities for buying refreshments to supplement their ordinary rations. C.s were once kept by civilians,

but in 1857 they were put under the control of the War Office, and became a recognised army institution. They were managed by a small committee of officers, and the goods were sold at practically cost price, any profit being spent for the benefit of the corps. A C. consisted of a beer shop, a grocery shop, and a coffee bar. The last-named supplied all kinds of non-alcoholic drinks. In France the C. is a club room used by the whole regiment for social purposes. The word has also come to be applied to the place where meals are provided by an industrial or other organisation for the benefit of members of its staff.

The First World War revolutionised the Brit. C. system. The existing organisation proved inadequate to provide for millions of men and women in the fighting services in all parts of the world. In 1915 an organisation called the Expeditionary Force C. (E.F.C.) came into being to conduct the C. business overseas. After paying working expenses and repayment of loans, all profits were devoted to the general welfare of the troops at the discretion of the Army Council. In 1916 the Navy and Army C.s Board (N.A.C.B.) was formed, whose main business lay in the U.K., but it also maintained C.s in permanent stations overseas. The profits were dealt with in a manner similar to those of the E.F.C. The E.F.C., being a purely war-time concern, ceased to exist in 1919, and its stock, etc., was taken over by the N.A.C.B. In 1920 an inter-departmental committee recommended that the N.A.C.B. should be enlarged and made permanent, and this found effect in the Navy, Army and Air Force Institute (N.A.A.F.I.), which is under the control of a council of members of the 3 services. The surplus profits of the E.F.C. and N.A.C.B. were handed over to the United Services Fund, after the dominions, colonies, and U.S. forces had been given an agreed share. The operations of the N.A.A.F.I. extend to every station at home and abroad where there are Brit. sailors, soldiers, and airmen, and a percentage of the profits in each locality is paid into unit funds. The N.A.A.F.I. system and its overseas counterpart, E.F.I. (Expeditionary Forces Institute), operated satisfactorily throughout the Second World War. C.s provided for employees in factories and other places of employment are sometimes termed staff restaurants (see RESTAURANT). See Sir J. Fortescue, *A Short Account of Cantelens in the British Army*, 1928.

Cantelupe, Thomas de (c. 1218-82), Eng. saint and bishop, nephew of Walter de C. (q.v.). He studied at Oxford, Paris, and Orleans, and became chancellor of Oxford Univ. (1262-3), and lectured in theology at Paris and at Oxford. He was appointed lord chancellor (1265), and was consecrated Bishop of Hereford in 1275. He became involved in a dispute with Archbishop Peckham in the Council of Reading (1279), who excommunicated him in 1281. C. appealed to Rome, and on his way died at Orvieto. He was buried in his own cathedral, and was popularly regarded as a saint, owing to

the miracles that were worked at his tomb. He was canonised as St Thomas of Hereford in 1320.

Cantelupe, Walter de (d. 1266), Eng. bishop. He held sev. rich rectories in plurality, and strongly resisted the interference of the papacy in England. He was consecrated Bishop of Worcester at Viterbo in 1237. He defended pluralities against the papal legate Otho (1237), and opposed the papal demand of a tenth for Henry III (1252). He supported the barons in 1264-5 and was summoned to Rome, but died before leaving England.

Cantemir, or Kantemir, Demetrius (1673-1723), orientalist, historian, and Prince of Moldavia. He studied as a youth in Constantinople, where he returned, 1700, as his brother's ambas. He returned to Moldavia as voivode, 1710, but next year declared for Peter the Great against Turkey, and on Peter's defeat retired with him to Russia. He took part in the Russian expedition against Persia, 1722. His first work was one of ascetic theology, 1698. He introduced a musical notation into Turkey. He was the first critical historian of the Rumanian principalities and of the Ottoman empire. (*History of the Growth and Decay of the Ottoman Empire*, 1734-5, is his only work trans. into English.) However, he anticipated the more extreme modern nationalism by claiming that the Moldavians and Vlachs were of pure Rom. descent. He was a member of the Prussian academy and a moving spirit in the foundation of the Russian. In philosophy he was influenced by J. B. van Helmont.

Canterbury, city and co. bor. of Kent, England, on the R. Stour, 56 m. ESE. of London. It forms part of the C. constituency of the parl. co. of Kent. The city is a co. of itself and is not in the administrative co. of Kent, although it is in the geographical co. It is a cathedral city, the see of the primate, and the eccles. metropolis of all England. C. occupies the site of the Rom. *Durovernum*. It was an important fortress and military station, being situated on the highway to London from Dover. To the Saxons it was known as Cantwarabyrig, 'town of the men of Kent,' and was the cap. of the kingdom of Kent. The see was founded about 597, when St Augustine became Archbishop of Canterbury, and from this centre Christianity spread through England (see CANTERBURY CATHEDRAL). The King's School, founded by Henry VIII in 1541, is attached to the cathedral. There are many anct churches in C., the most notable being St Martin's, part of which is built of Rom. brick and tile of the 6th cent.—in its font St Augustine is supposed to have baptised King Ethelbert; and St Dunstan's, containing the burial-vault of the Roper family, with the head of Sir Thomas More. C. has the ruins of a Norman keep, a guildhall (1439; rebuilt 1697), now demolished, and a hospital for poor brethren, founded by Archbishop Lanfranc. The Chequers Inn, immortalised in the *Canterbury Tales*, and an anct artificial mound, Dane John, possibly a corruption of donjon, are of special

interest. The most famous archbishops have been St Augustine, St Dunstan, Lanfranc, Anselm, Becket, Crammer, and Laud. The Archbishop of C. is the first peer of the realm, and crowns the sovereign in Westminster Abbey. The city's chief trade is in fruit; it is a market and shopping centre for E. Kent. The industry of weaving, introduced by the Walloon and Huguenot refugees, who settled in C. in large numbers, at one time employed 2000 persons and has of late years been to some extent revived in the old, gabled, half-timbered houses of the C. weavers. Chaucer is associated with C. through his lively picture of a party of pilgrims coming to the shrine of St Thomas Becket in the *Canterbury Tales*; it is the bp. of Marlowe, who was educ. at the King's School. Charles Dickens used to stay at the Fleur de Lis Hotel, which retains a 13th-cent. window. The author of *The Ingoldsby Legends* was born here. An engine built by George Stephenson in 1825, and used on the C. and Whitstable railway is preserved here. The Buffs' war memorial is in St Michael's Chapel in the cathedral, the Kent co. war memorial on the bowling green, and the city of C. war memorial opposite Christ Church gate. The cathedral escaped destruction in the Second World War, but of the rest of C. damage from air attack extended over one-quarter of the city area. Subsequent demolitions revealed considerable Rom. remains. One of the most important discoveries since excavation was begun in the bombed area of C., to ascertain the lay-out of the Rom. city, was made in 1948, with the finding of the massive remains of the Rom. public baths of the city, with walls more than 5 ft thick. Since then further excavations have given the lay-out of the Rom. streets in the bombed area; these confirm that the Rom. wall was on the line of present city wall and ran right round to the W. Gate. In all probability there was continuity from the Rom. to the Saxon period. Remains of the largest Rom. theatre in this country have been found. The city returns 1 member to Parliament. Pop. 30,000.

Canterbury, prov. dist. in the centre of S. Is., New Zealand. It covers an area of 14,040 sq. m., 3900 sq. m. of which form the C. plains sloping from the mts to the coast. The wheat-growing and sheep-rearing for which this part is noted are all carried on in this dist. It is from here that the celebrated C. lamb and mutton of the Eng. market comes. Dairy-farming and cheese-making, also cocksfoot grass seedling, are the prin. industries of Banks peninsula, a volcanic region with rich soil. The cap. is Christchurch, and the chief ports are Lyttelton in the N. and Timaru in the S. Pop. 307,024.

Canterbury, metropolitan municipality of Sydney, in Cumberland co., New S. Wales, Australia. C. ranks third in order of pop. in the metropolis. Pop. 111,400.

Canterbury Bells, see CAMPANULA.

Canterbury Cathedral. The splendid cathedral at Canterbury is in the form of

a double cross, with a central and two W. towers. The total length is 523 ft, the E. transept measuring 154 ft. Various styles of Gothic architecture are represented, Transitional-Norman and Perpendicular predominating, and the cathedral illustrates some four cents. of progress in eccles. building. It is difficult to say how many buildings have previously stood on the site of the present C. C., though Bede mentions that St Augustine 'recovered' a church at Canterbury which had been built during the Rom. occupation. Certainly a great fire (1067) caused Archbishop Lanfranc (1070-93) to rebuild the church then existing, but although further renovated by Prior Ernulf between 1096 and 1107, and by Prior Conrad between 1107 and 1126, this church was also devastated by a fire which destroyed the choir in Sept. 1174. Here was an opportunity to make the church worthy of the memory of the martyred St Thomas Becket, murdered in St Benedict's chapel in the NW. transept, 29th Dec. 1170, and a new choir was completed before the end of the 12th cent. The chief artificer during the 12th cent. was a Frenchman, Wm of Sens. On his death Wm the Englishman took over the reconstruction, and he was responsible for the E. crypt and the Trinity chapel above. The side screens were added in the opening years of the 14th cent., and between 1376 and 1410 the Norman nave of the previous church was replaced, largely under Prior Chillenden, and the transepts built. With the addition of Cardinal Morton's great central tower the church was completed in 1500. The numerous chapels originated from the great wealth of relics possessed by the church, and the necessity of finding shrines for them. These relics included those of the bodies of the saints Blasius, Dunstan, Wilfrid, Alphege, and Becket, the most important, whose shrine stood in the Trinity chapel immediately behind the high altar. The body was first interred in the crypt, but in 1220 it was translated to the then newly erected chapel on the site of that in which Becket had first solemnised mass after becoming archbishop. In the Middle Ages C. C. owed much of its European fame and great riches to this shrine. But in 1538 Henry VIII solemnly issued a writ of summons against Thomas Becket, sometime Archbishop of Canterbury, accusing him of treason and contumacy, and the shrine which from the early 13th cent. had been enriched by many costly gifts from royal and other pilgrims was dismantled. Further destruction was wrought by the iconoclasm of the Puritans at the time of the Civil war: windows were shattered, the choir stripped, and the monuments defaced. In 1872 fire destroyed the outer roof of the Trinity chapel. The precincts are entered by Christ Church gate (now refaced in the upper regions), built in 1517 and a striking example of Perpendicular work. The SW. porch, the prin. entrance to the cathedral, was built by Prior Chillenden, c. 1400, but the figures in the canopied niches are of 19th-cent. workmanship.

The nave. The present nave dates from the late 14th cent., when it was rebuilt (with the exception of the NW. tower, taken down in 1832). The aisles with the clustered pillars are narrow and lofty. In monastic times the nave was the people's church. Owing to the crypts the choir is raised well above the level of the nave, which is very high in proportion to its breadth. The monuments in the N. aisle include that to Archbishop Benson (1896). The unusual shaped font dates from 1639. Near the E. end is a marble monument to the men of H.M.S. *Kent* (battle of the Falkland Is., 8 Dec. 1914).

the vaults in the circuit around the choir were now arch-ribbed with key-stones; and replacing the old wooden ceiling was a beautifully constructed stone vault. The single triforium gave place to two in the choir and a third in the aisle of the church. The monuments in the choir are nearly all of eccles. dignitaries, the most conspicuous being that in memory of Henry Chichele, archbishop from 1414 to 1443, founder of All Souls, Oxford. The Decorated screen which surrounds the choir was constructed by Prior de Estria (Henry of Eastry, prior from 1285 to 1331) early in the 14th cent. The SE.



Copyright Walter Scott, Bradford

CANTERBURY CATHEDRAL: THE SANCTUARY

In the S. aisle is a tablet to Dean Farrar (1903), author of *Eric, or Little by Little*. The piers supporting the central tower are the original piers of Lanfranc's building encased with Perpendicular works by Chillenden. From one pier hangs the flag flown by H.M.S. *Canterbury* at the battle of Jutland.

The choir is the most important specimen of Transitional-Norman work in the country, using both the pointed and the rounded arch. It was the work of Wm of Sens between 1174 and 1179, and of his successor, Wm the Englishman, after 1179, who rebuilt Prior Conrad's 'glorious choir' which had been burnt. Gervase of Canterbury (q.v.), in chronicling the difference between the new work and the older Romanesque choir of Conrad, describes the changed mode of workmanship and design. The pillars were elongated and the new capitals exquisitely sculptured;

transept is an adaptation of the work of Ernulf by Wm of Sens, conforming to the new design of the choir. A little further E. on the S. aisle is St Anselm's chapel, forming part of the tower of the same name. Behind the high altar is St Thomas's or Trinity chapel, built to receive Becket's shrine, and the whole of this part of the choir from the screen eastward is the work of Wm the Englishman. The site of the shrine is shown by the marks worn in the stones by many generations of pilgrims. The curious mosaic pavement resembles that round the shrine of Edward the Confessor in Westminster Abbey. Near this site is the tomb of Edward the Black Prince (1376) with reproductions of his accoutrements above, and facing it the tomb of Henry IV and his consort, Joan of Navarre. The circular chapel at the E. end of the cathedral is known as the Corona, or

Becket's Crown. Near by, against the N. wall, is the tomb of Cardinal Pole (*d.* 1558), the last archbishop who acknowledged the supremacy of the Pope. In the centre of the Corona is the marble chair known as the 'Chair of Augustine,' in which each Archbishop of Canterbury is seated at his enthronement. There is also a memorial to Archbishop Temple, whose grave is in the cloister garth. Opposite Becket's tomb is the chantry of Henry IV. completed in the first half of the 15th cent. N. of the presbytery is the chapel of St Andrew, corresponding to

latter is notable for its Pointed arcading. Here Becket's body was placed for 50 years before its translation to the shrine in Trinity chapel. Here also Henry II did penance and was scourged by the eccles. authorities.

The monastic buildings stood on the N. side of the cathedral, and were extensive, comprising quarters for the monks and for the prior, and a separate palace for the archbishop, the domestic offices necessary for maintaining a great monastic house, the infirmary with its own chapel and cloister, accommodation for guests, and



Will F. Taylor

CANTERBURY CATHEDRAL

that of St Anselm on the other side of the choir, and one of the oldest parts of the building. Both the E. transepts are notable for the skill with which Wm of Sens adapted the work of Ernulf, and that of Conrad which succeeded it, to make it harmonise with his own choir. The NW. transept was much altered by Chillenden when building the nave; he also built the SW. transept. Leading out of the latter is St Michael's or the Warrior's chapel, in the Perpendicular style, and containing the coffin of Archbishop Stephen Langton, leader of the barons at Runnymede. The very fine Norman crypt is entered from the S. transept; the sculptured capitals are very striking. The W. portion was built by Ernulf in Anselm's time, while the E. portion or crypt of Trinity chapel was the work of Wm the Englishman. It is loftier than the W. end, and like the

the great cloister, rebuilt by Prior Chillenden at the same time as the nave, and incorporating some parts of Lanfranc's earlier building. The cloister is complete; it is 144 ft square, and the N. wall retains some beautiful Early Eng. arcading, and the vaulting is enriched with a fine display of heraldry. From the NW. corner there is a splendid view of the great central tower. Lanfranc's chapter-house, in the E. alley of the cloister, was rebuilt c. 1304 and the roof renewed in 1405-6. It was restored and reopened on the thirteenth centenary of the landing of St Augustine (1897). The cathedral was shaken by air attack during the Second World War, and a number of buildings within the precincts were destroyed or severely damaged, including the medieval school room, canonical houses, the deanery, and the King's School dining-hall. Of the

cathedral itself, only the library was totally destroyed, but the concussion sustained by the fabric made plans for a major restoration necessary, and these were laid in 1946. The beautiful and valuable medieval glass, dating from the 12th, 13th, and 15th cents., had all been removed to safety, but has now been re-instated. See R. Willis, *The Architectural History of Canterbury Cathedral*, 1845-69, and M. A. Babington, *Canterbury Cathedral*, 1948.

Cantharidae, or Meloidae, family of coleopterous insects in the div. Heteromera, known popularly as blister beetles or oil-beetles. The species, of which about 1500 are classified, are subdivided into winged Cantharides and wingless Meloides, and many of them are remarkable for their power of raising blisters when in contact with the skin. The term 'Sp. flies' is a commercial term. *Cantharis vesicatoria* is the true Sp. fly, *C. vesicatoria* being known as blister beetle. *C.* (or *Lytta*) *vesicatoria* occurs in Spain, France, Italy, and S. Russia, and has this property. Species of *Myiabris* yield the so-called China cantharides, the 'Telni fly' of India (*Myiabris cichorii*) giving twice as much cantharidin as the ordinary *C.* They are about three-quarters of an inch long, bright green in general colour, with legs and antennae bluish-black. When touched they feign death and emit a penetrating odour. The larvae feed on the roots of plants, but those of the *Sitaris humeralis* feed on the eggs of a bee, while the young of *Epicauta vittata* live on the eggs of a locust. The drug called cantharides is prepared from the dried bodies of *C. vesicatoria*, and is used on account of its blistering properties.

Cantharus, typical genus of a section of *Sparidae*, or sea-breams, is to be found in the Mediterranean, the Atlantic, and off the coasts of Africa and India. The species lack molar and vomerine teeth, are carnivorous and edible. *C. lineatus* is known both as the black sea-bream and as old-wife.

Cantharus, wide-bellied drinking vessel with handles, varying in size and form. Often dedicated to Bacchus, and decorated with Bacchanalian scenes.

Can-tho, cap. tn of prov. of same name in S. Cochín-China on r. b. of the W. arm of the R. Mekong (q.v.). *C.* stands 43 m. from the sea and is a busy riv. port. The prov. of *C.* is mainly engaged in rice cultivation.

Canticles, Vulgate Canticum Canticoorum, trans. of the Heb. title, which is a superlative (cf. Holy of Holies), a love poem written at a much later date than Solomon, but attributed to him as a great lover, a quite reputable literary device. Some have made it a poetic drama, others reject its unity and make it a collection of love poems. The love of the 2 pastoral sweethearts is described in sensuous imagery of great beauty. But it stands in the Bible not as a mere description of earthly love, however chaste and true, but as an expression of the love of the soul and of the Church for God, often described in the prophets as a betrothal or bridal

union (as also in the N.T.). The Fathers of the Church are unanimous in this interpretation. By an extension it has been applied to the Blessed Virgin, as *par excellence* the loving soul and the Bride of the Spirit. Rabbi Aqiba said: 'All the Hagiographa are holy, but the Canticle is most holy' (cf. Mishnah, *Yadayim*, 3, 5); see commentaries by Origen, St Ambrose, Rupert of Deutz, St Bernard, Harper (1907), Haller (1940).

Cantigny, Battle of, battle of the First World War; the first independent operation of Amer. troops after the U.S.A. entered the war. The 1st Div., about 30,000 strong, took over the Montdidier sector from the 45th Fr. African Div. of shock troops. Facing them in a salient of which *C.* was the main feature was the Seventh Ger. Army, under Gen. von Boehn. On 28 May 1918 the Americans attacked after a 2-hour bombardment, and with splendid dash reached their objective, advancing 1 m.

Cantilan, tn, prov. of Mindanao, Philippine Is., 47 m. SE. of Surigao. Pop. 20,519.

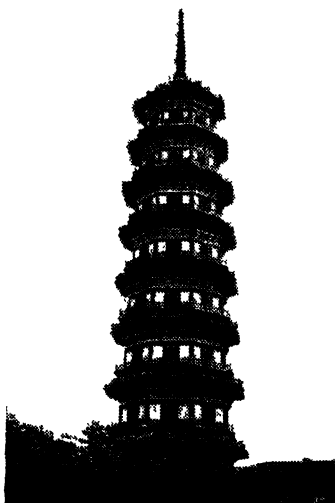
Cantilever, in building, a beam projecting like a bracket from a wall, and held down at that end either by the weight of the wall or by some other means, and capable of carrying a weight on the remainder of its length. The principle of the *C.*, though not new, has been widely developed in architecture of the 20th cent.; notably in the generous provision of cantilevered balconies for modern flats, and *C.s* for the roofs on is. platforms of railway stations. Another important use of the *C.* principle is its application to bridges. The idea has been applied to the bridging of spaces too wide to be crossed by a single plank from the earliest times, and in its simplest form is still employed by many E. nations. In these primitive *C.* bridges 2 planks, firmly fixed in the banks, project over the stream, and are connected by an independent truss overlapping the end of each. The principle has recently been greatly developed, and applied in cases where girders or suspension bridges are impracticable. The modern practice is to erect in the bed of the riv., at a convenient and equal distance from each bank, 2 piers each supporting 2 *C.* arms, one of which extends to the shore and the other over the stream. These outer ends are connected by another truss. The first modern bridge erected on these lines was one over the Niagara R., designed by Charles C. Schneider in 1882; and another famous example is the Forth bridge, Scotland, with its 2 great *C.* spans of 1760 ft. The *C.s* of the Lansdowne bridge over the Indus at Sukkur are supported by the bank itself. The bending stress of a *C.* causes it to bend with a convex curve upwards, in the opposite direction to the curve of a bridge supported at both ends. See also BRIDGE.

Cantire, see KINTYRE.

Canto Fermo (It.), see CANTUS FIRMUS.

Canton, John (1718-78), scientist, b. t'roun; spent most of his life in London, part of the time as a school-teacher. His

researches in physics were mainly in the field of electricity, for discoveries in which he was made a fellow of the Royal Society in 1749, gaining the Copley medal in 1751. Among his other work may be mentioned the invention of the pith-ball electrometer, the verification of Franklin's identification of lightning and electric fluid, and his demonstration of the compressibility of water, for which he received the gold medal of the Royal Society. He investigated phosphorescence in the sea, tracing it to the decomposition of animal matter. He wrote sev. treatises in the *Philosophical Transactions*. See also CANTON'S PHOSPHORUS.



E.N.A.

THE GREAT PAGODA, CANTON

Canton: 1. Cap. of the prov. of Kwangtung, and one of the first cities in China. It stands on a riv., almost on the seaboard, 90 m. NW. of Hong Kong. Until recent years it was surrounded by walls, and had narrow, crooked streets. A great part of the pop. live in boats on the riv. A municipal council was estab. in 1918, and demolished the old city wall, replacing it by a motor road 6 m. long. C. has now 4 parks. The entire circuit of the city is 10 m. Its mint formerly issued coins, all bearing a picture of Dr Sun Yat-sen. There are factories and sev. hundred workshops for producing hosiery, matches, silk, porcelain, metal goods, and fancy goods. Its exports included tea, silk, and cassia. Recently canned-food factories (especially fruit-canning plants), sugar factories, and paper-mills have been constructed; export of fruits is one of the main items of China's foreign trade. There are numerous

temples (chiefly Buddhist), pagodas, and many curio shops, a Rom. Catholic cathedral, a Church of England church, and a masonic hall. Sev. lines of railway start from C., reaching Hankow to the N. and Kweilin to the S. The pop (1954) was just over a million. From 1917 there has been much turmoil and fighting at C. In 1924 \$4,000,000 worth of damage was done while Dr Sun Yat-sen was suppressing the Merchants' Volunteer Corps. In 1925 the foreign concession, Shameen, was besieged for 4 months. An attempt to estab. a Communist regime in Dec. 1927 was crushed after 3 days, but only after many lives were lost and much damage done to property. An administration was then set up known as the S. China Gov., which for the next 10 years acted in semi-independence of the central gov. at Nanking. C. was the centre of the nationalist spirit in China, and was the base of the republican revolutionary movement, Dr Sun Yat-sen being himself a Cantonese. For this reason the Japanese encountered stiff resistance in C. during their invasion of China, but after a period of severe bombing the city fell to the Japanese on 21 Oct. 1938, and remained in their hands until the end of the Second World War. The centre of the city was reduced to ashes, and large areas, including industrial works, were demolished by the Chinese Army before their retreat from the city. While in the possession of the Japanese, C. was subjected to further bombing by the U.S. Air Force at intervals during 1942-5. There were anti-British riots in C. in Jan. 1948 during which the Brit. Consulate was destroyed. The riots arose out of demonstrations resulting from the eviction by the Brit. authorities of some 2000 Chinese 'squatters' in Kowloon. The city was captured by the Communist Army in the spring of 1950.

2. City, co. seat of Stark co., Ohio, U.S.A., 52 m. SE. of Cleveland. Industries include steel mills, roller bearings, and an oil refinery. There are also fire-clay quarries and coal-mines. It was the home of President McKinley. Pop. 116,900.

Canton: 1. Geographical area in Switzerland, with its own laws and a local gov. which looks after domestic affairs such as taxation and control of public money. Foreign policy, control of the army, etc., are left to the central gov., which is at Bern.

2. In France a term meaning a subdivision of the arron.

Canton River (Chinese Chukiang, pearl riv.), arm of the delta Sikiang in the prov. of Kwangtung, China. It is the lower portion of the Pekiang R. About 45 m. below C. the riv. is called Bocca Tigris, or Tiger Gate. The estuary of the riv. S. of Bocca Tigris is called Outer Waters. The celebrated Bogue Forts, taken by the English in 1841 and 1856, guard the entrance to this part of the riv.

Cantonments, military term applied to a temporary resting-place for troops. On active service, troops in C. are quartered actually in a tn or vill., and the term is also used when they are detached and

quartered in sev. neighbouring tns. The most common use of the word was in relation to military settlements in Brit. India, where C. were equivalent to permanent barracks, situated at a short distance from a tn, or formed isolated military stations. See also BILLETING.

Canton's Phosphorus, form of calcium sulphide which, after exposure to sunlight, itself emits light for some time. Pure sulphide (CaS) does not show the same property. It was discovered by John Canton (q.v.) in 1768 by heating oyster shells with sulphur.

Cantor, Eddie (real name Edward Iskowitz) (1892-), Amer. comedian, b. New York City. He appeared on the stage at 14 with Gus Edwards's children's troupe (*Kid Kabaret*); from 1916 to 1919 he was in New York musical productions, including *Ziegfeld Follies*. His first star role was in 1917 in *The Midnight Rounders*. He made his film debut in *Kid Boots* in 1926, and made many famous pictures including *Palmy Days*, *The Kid from Spain*, *Roman Scandals*, and *Kid Millions*. He is at present engaged in television.

Cantor, Georg (1845-1918), Ger. mathematician, b. St Petersburg (Leningrad) and educ. Berlin and Göttingen. Prof. C. mathematics at the Univ. of Halle, of created a new field of mathematical investigation and provided a powerful instrument for dealing with the foundations of mathematics and for stating the inevitable limitations to which mathematical results are liable. In 1870 he solved the question of the uniqueness of the representation of a function by Fourier's series. His chief work is *Contributions to the Founding of the Theory of Transfinite Numbers* (pub. in London and Chicago in 1915), in which he developed the theory of sets of points. For his research in pure mathematics he was awarded the Sylvester medal in 1904. He d. at Halle.

Cantoris, in architecture, the N. side of a choir on which the cantor or precentor sits facing the Dean. From the fact that the precentor sits opposite the dean, the 2 sides of the choir are named Decani (i.e. 'of the Dean') and C. (i.e. 'of the Precentor').

Canù, Cesare (1804-95), It. historian and novelist, b. Brivio near Milan. He was a prof. of It. literature and language at Como, Milan, and Sondrio. He was thrown into prison between 1832 and 1833 for remarks made against the policy of the Austrian Gov. in his book *Ragionamenti sulla Storia Lombarda nel Secolo XVII*. While in prison he wrote his historical novel *Margherita Pusterla*, pub. in 1838. His great work is his *Storia Universale* (1836-42) in 35 vols., which brought him in £12,000 in royalties; but it is often polemical, and written with a strong clerical bias. His books for young people are *Letture Giocanti* and *Il Galantuomo*. Among his other works are *Storia degli Italiani*, 1855-7, which is in 6 vols., and *Italiani Illustri, Ritratti*, 1870-2, in 3 vols.

Canù, It. tn. in Lombardy (q.v.), 5 m. S.E. of Como (q.v.). It has furniture and silk manufs. Pop. 14,000. See BRIANZA.

Cantus Firmus (Lat. = It. *canto fermo*), in old polyphonic music, especially masses and motets, up to the end of the 16th cent., it was customary to use a folk or popular tune (often associated with highly unsuitable words) or a plainsong theme, sung in one part (usually the tenor) in long notes and to weave a contrapuntal web of parts round it. The C. F. was usually so slow and so deeply buried in the elaborate surrounding parts as to become completely unrecognisable in performance. See also PLAINSONG.

Canuck, popular term in the U.S.A. for all inhab. of Canada. In the dominion itself it is more often applied to the Fr. Canadians. The word is supposed to be of Indian origin.

Canusium, see CANOSA DI PUGLIA.

Canute (Cnut) the Great (d. 1035), second King of Denmark of his name, and King of England. He was the son of Sweyn, King of Denmark, who, after conquering England and driving Ethelred II (q.v.) into exile in Normandy, d. at Gainsborough in 1014. Ethelred at once returned to England. In 1015 C. invaded England, over-running most of the country and defeating Ethelred, who d. 1016. Ethelred's son, Edmund Ironside, continued the battle against C. but after being defeated at Assandun (Ashington) Edmund agreed to a div. of the country, by which he kept Wessex and C. took Mercia and the N. This agreement would probably have proved unworkable, but in Nov. 1016, Edmund died, leaving C. undisputed King of England. Edmund's young sons fled to Hungary and C. married Emma of Normandy, Ethelred's widow. C. soon consolidated his position in England, dividing the country into earldoms, on the Dan. pattern. He gained popular favour when he sent large numbers of his soldiers back to Denmark; he was prepared to place Saxons in positions of importance and Saxon nobles went with him on his expeditions against Sweden and Norway. Under his rule, Eng. trade revived, and cultural contacts with Europe increased; while a lengthy legal code is one of the salient features of his reign. C. is traditionally remembered for his piety, though he committed sev. acts of great barbarism when personal interest demanded it. Though he brought many benefits to England, Eng. taxes had to pay for his foreign house-carles and his foreign wars, and the many Scandinavian names recorded in Domesday Book, scattered as they are all over England, suggest that many of C.'s followers received Eng. land as a reward for their services to him. C. became King of Denmark in 1018, and of Norway in 1030. On his death C. was succeeded by his illegitimate son Harold I (q.v.). The story of his rebuke to his flattering courtiers is told by Henry of Huntingdon. It describes how C. sat by the seashore as the tide rose and commanded the waves to come no nearer. When the tide reached him, he rebuked his courtiers for their flattery, saying that he could not prevent the encroachment of the waters though they called him king. Holinshed also tells this story. See L. M.

Larson, Canute the Great and the Rise of Danish Imperialism, 1931.

Canvas, heavy, strong cloth, made of jute, hemp, or flax. The strands or fibres are woven in exactly the same way as in linen. Although the C. used for sailcloth is sometimes made from hemp and other fibres, the best and strongest kinds are made from flax, and generally in widths of 24 in. A piece, or bolt, is 40 yds long. There are different kinds of C., varying according to weight. Artists' C. used for oil paintings is one of the finest kinds of C., and the sails of racing yachts are often cotton-duck. The term C. is also used to denote a coarse type of plain cloth having hard twisted yarns.

Canvassing, soliciting votes at an election, or trade or business by commercial travellers.

Canvey, is. in the Thames estuary off the Essex coast, 30 m. E. of London, area 7 sq. m. It was reclaimed from the sea in the 17th cent. It is reached by rail, the station being at Benfleet, with which it is connected by a bridge. In Feb. 1953 the is. was flooded and much damage caused in the winter gales. Pop. 11,258.

Canyon (Sp. *cañón*, a gorge), deep and narrow valley or gorge which has been cut by the action of a riv. In Colorado the Grand C. (q.v.) is a perfect and beautiful example of this natural formation of the earth's surface. The riv. here has carved its way through solid rock, in parts to the depth of 6000 ft and not a mile in width. The walls are of sandstone and limestone with varying colours, quite bare of vegetation, and also cut into buttresses and terraces by the action of the atmosphere. There are other causes for these deep cuttings besides the work done by the stream itself; one is the continual uplifting process which maintains the rapid flow of the riv., and the other the dry climate which keeps the rocky walls from being crumbled away by frost and springs. At Niagara there is also a fine gorge below the falls, due to erosion by the water in a 'young' land.

Canzone, form of poetry used principally for love lyrics, though occasionally for religious and other subjects. The earliest specimens from Provence date from the 12th cent., and those of Italy from the 13th cent. The number of stanzas was generally five or six, but they varied sometimes, and the last stanza was often shorter than the others. In Provençal C.s the same set of rhymes went through all the stanzas, but in the Italian a fresh set was introduced for each stanza. Dante, Petrarch, Tasso, and Leopardi all wrote this form of poetry. Drummond of Hawthornden wrote the best examples of Eng. C.

Canzonet (from It. *canzonella*, dimin. of *canzone*), in music, a short song in parts for sev. voices, set to light verses; from the 18th cent. onwards also for a single voice.

Cão, Diago, see CAM.

Cao-bang, cap. of the prov. of the same name in N. Tonking (q.v.), close to the Chinese frontier. The country is mountainous and picturesque. Tin, wolfram,

gold, and iron are mined and there are fine forests. The inhab. include Tho, Nung, Man, Meo, and Vietnamese.

Caodaism, religion, native to Viet Nam, which numbers appreciably more than a million adherents. Its Holy See is at Tay-ninh, Cochín-China, where there is a large and architecturally remarkable cathedral built by the first pope. C. was first founded in 1926 and claims to embrace all the prin. religions of the world. It is headed by a pope and boasts a college of cardinals (some female), bishops, and priests. See G. Gobron, *Histoire du Caodaïsme*, 1948.

Caoutchouc, see RUBBER.

Cap-de-la-Madeleine, city in Quebec, Canada, on the N. shore of the St Lawrence R., near Trois-Rivières. Prin. industries are pulp and paper, aluminium products, paper boxes, and bags. Pop. 22,800.

Cap Haïtien, city and port in the rep. of Haiti, cap. of Nord dept, and an episcopal see, situated in a magnificent harbour 5 m. from Port au Prince. Under the Fr. gov. it was the cap. of Haiti. It is connected by cable with France, S. America, and the Dominican Rep. It is a trading and export centre founded in 1670 by the French. Near by was fought the last decisive battle for independence (1803).

Capablanca, José Raoul (1888-1942), Cuban chess player and diplomat, b. Havana. At the age of 12 he won a formal match against the chess champion of Cuba, Graduated at Columbia Univ., New York. In 1909 he beat Frank Marshall, the chess champion of the U.S.A., and, in 1911, took the first prize at the international tournament at San Sebastian. Financial disagreement postponed his meeting with Dr Emanuel Lasker for the world's championship for nine years, but in the intervening period the 2 met as competitors in the St Petersburg tournament, when Lasker won by half a point. At Cuba in 1920 he at length met and defeated Lasker easily, Lasker complaining of the climate. C. held the championship from 1921 to 1927, losing it at the first challenge to Dr Alekhine—he won 3, lost 6, and drew 25 games, but dictated the style of the play. He continued to gain remarkable victories, including his win over Dr Euwe in 1931 and tie with Botvinnik—5 points ahead of Lasker—in the Moscow tournament of 1935. The characteristics of his play were simplicity, mathematical exactitude, and a perfect sense of timing. Wrote 2 admirable text-books in English: *Chess Fundamentals*, 1922, and *A Chess Primer*, 1935.

Capacitance, the ratio of electric charge to potential of a conductor, or the charge needed to raise the potential by 1 unit. C. is measured in farads, F (see UNITS, ELECTRICAL); in practice the microfarad, $\mu F = 10^{-6}$ F, is used. A cable carrying direct current is normally at a constant potential and a charging current flows only at the initial charging-up when the cable is switched on to the supply. On alternating current the potential in alternating and at each reversal a considerable

charging current flows. See CAPACITOR; CIRCUIT, ELECTRIC; TRANSMISSION, ELECTRIC POWER.

Capacitor, or condenser, name given to 2 electrical conductors separated by insulating material (dielectric). The Leyden jar was the first form of C., the nature of the equal and opposite charges on the coatings being correctly interpreted by Franklin, who also constructed the first parallel-plate C., 2 equal lead plates separated by a glass pane. The capacitance of a plate C. is directly proportional to the area of the plates, inversely proportional to their distance apart and dependent on the dielectric. Variable C.s of small capacitance may be made by 2 sets of interleaved sector-shaped plates, one set being fixed, the other being rotated around the common axis so as to present a varying area to the fixed sectors; or as 2 cylinders, one sliding inside the other. Large C.s used for power-factor correction on transmission lines are made on the plate principle, the plates being rolled up in many layers. Batteries of such C.s are used on the Swedish 380 kV. lines. See CAPACITANCE; CIRCUIT, ELECTRIC; TRANSMISSION, ELECTRIC POWER; POWER FACTOR.

Capacity, in law, means competency or ability to do any legal act or hold any office, and the state of possessing the necessary discretion to be chargeable for one's crimes. In the law of contracts, e.g., lunatics and infants are, generally speaking, incapable of entering into binding contracts. In criminal law children under 8 are absolutely incapable of committing a crime. Between 8 and 14 the infant is still presumed to be *doli incapax*, but the presumption may be rebutted by evidence of discretion in the infant.

Capacity, power of containing a quantity. *Cubic C.*, the number of units of vol. in a solid or closed space. *C. for heat*, the amount of heat required to raise the temp. of a body one degree. *Electrical C.*, see CAPACITANCE.

Capacity, Measure of, see METROLOGY.

Capaneus, Gk hero who took part in the first expedition of the Seven against Thebes. While he was trying to scale the walls he was struck by lightning by Zeus.

Cape Breton Island, rocky is. at the E. extremity of Nova Scotia, Canada; now joined to the mainland by Canso Causeway, 4500 ft long and 80 ft wide, with highway and railway. The greatest length of the is. is 110 m., the greatest width 85 m., and the area 3120 sq. m. It is bisected by the waterway formed by the Inlet of the Bras d'Or, on the E. coast, the lake into which it widens, and the St Peter's Ship Canal, which joins this lake to the Gut of Canso. The Bras d'Or lake is 50 m. long, 20 m. broad, and from 12 to 60 fathoms deep. It is surrounded by beautiful scenery, and renders practically the entire is. accessible by water. The N. portion of the is. is much more mountainous and rugged than the S., and rises to an elevation of 1800 ft at N. Cape. The coast is deeply indented by numerous bays and harbours. The climate is milder than that of the mainland, but very moist. The harbours are

open all the year round. A certain amount of grain is grown, and there is considerable mineral wealth, coal and iron (in the Sydney dist.), copper, marble, granite, limestone, slate, gypsum, and salt being mined and exported. Lumbering and fishing are important industries. The is. is a great tourist resort. The pop. of N. C. B. is mainly of Scottish highland descent, and Rom. Catholic by religion. Gaelic is still spoken. In the mining dists. there are many Irish and Italians. There are also Fr. Acadians and some Micmac Indians. The is. is divided into four cos.: Richmond, Inverness, Victoria, and C. B. The chief tns are Sydney, Arichat, Port Hood, and Louisbourg. C. B. was ceded to France in 1654 at the peace of St Germain. The French settled and fortified Louisbourg, 1713-20. This fortification was captured by New Englanders in 1745, returned to France by the Treaty of Aix-la-Chapelle in 1748, captured by the British under Amherst and Wolfe in 1758, and finally became British in 1763 and was annexed to Nova Scotia. It was made a separate prov. in 1784 with Sydney as the cap., but in 1820 it was annexed to Nova Scotia again. Over 4,000,000 tons of coal are now shipped yearly. Pop. 157,696. See A. C. Walworth, *Cape Breton: Isle of Romance*, 1947.

Cape Coast, tn on the W. coast of Africa, in Ghana, and once the cap. of the Gold Coast; the site of a Portuguese castle built in the 16th cent., when C. C. was an important slave depot. Exports are cocoa and palm products. Pop. approximately 20,000.

Cape Cod, sickle-shaped sandy peninsula of Massachusetts, U.S.A., 65 m. long and 1 to 20 m. broad. It is a favourite summer resort, and there are numerous small vils. and settlements. It produces huge quantities of cranberries and some asparagus.

Cape Colony, see CAPE PROVINCE.

Cape Coloured People, name given to the mixed pop. of Cape Town and surrounding areas in S. Africa. They are descended from Europeans, Hottentots, and E. Indian slaves, with some admixture of Negro. To-day there are about a million, living mainly in Cape Town and Port Elizabeth. They speak Afrikaans, and, except for 60,000 Muslims (the 'Cape Malays'), are Christians. Formerly they had the vote and mixed to some extent with Europeans, but the present S. African Gov. has taken the vote from them and is trying to group them into inferior residential areas apart from Europeans. See W. M. MacMillan, *The Cape Colour Question*, 1927, and S. Patterson, *Colour and Culture in South Africa*, 1953.

Cape Fear River, N. Carolina, U.S.A., formed by the junction of the Deep and Haw R.s., enters the Atlantic at Cape Fear, 20 m. S. of Wilmington. About 200 m. long, the head of navigation is Fayetteville.

Cape Girardeau, city and riv. port in Missouri, U.S.A., on the Mississippi R. (bridged) 100 m. SSE. of St Louis. It

manufs. shoes, cement, and wood and tobacco products. SE. Missouri State College is here. Pop. 21,600.

Cape Golden Mole, see *CHRYSOCHLORIDAE*.

Cape Henry, Action off. The British in 1781 occupied Portsmouth on the James R. in Chesapeake Bay, N. America, and the Fr. squadron at Newport, Rhode Is., proceeded thither under the command of Commodore des Touches. He was met by Vice-Adm. Marriot Arbuthnot off C. H. on 16 Mar. A fight followed which was indecisive, the French losing heavily. The result of the battle was that the English once more gained command of Chesapeake Bay.

Cape Horn (Sp. Cabo de Hornos), headland on a small is. of the Fuegian Archipelago, forming the southernmost point of S. America. It was sighted by Drake in 1578, and named by the Dutch in 1616.

Cape Hunting-dog, see *HYAENA DOG*.

Cape Pondweed, see *APONOGETON*.

Cape (Cape of Good Hope) Province, or **Kaapland** (formerly **Cape Colony**), the most southerly portion of Africa, forming a prov. of the Union of S. Africa. It is named after the promontory on the SW. coast discovered by Bartholomeu Diaz in 1488 and named then Cape of Storms, but afterwards renamed Cape of Good Hope by the King of Portugal. The boundaries of the prov. are Bechuanaland Protectorate on the N., SW. Africa, formerly Ger. SW. Africa, on the NW., and on the NE. and E. the Transvaal, Orange Free State, Basutoland, and Natal. The breadth of the prov. may be measured by its diameters (NE. to SW. and NW. to SE.), which are respectively 750 and 800 m. long. It comprises Brit. Bechuanaland and the extremity of the African continent S. of the Orange R. and Natal, including the Transkei ter. It is nearly twice the size of the U.K. The total area is 277,170 sq. m. (the prov., 260,615 sq. m.; Transkei ter., 16,555 sq. m.).

Coastline. The coastline from the mouth of the Umtamoussa on the E. to the mouth of the Orange on the W. measures some 1300 m. The estuary of the Kynsna, on the S. coast, provides the only good natural harbour of the prov. But excellent docks have been constructed at E. London and Port Elizabeth (qq.v.), and at Mossel Bay (q.v.) there is a smaller but efficient harbour. Skirting the coast westward, the traveller will pass the mouths of many mt. torrents, broad stretches of forest, and the green slopes of mt. ranges. Further to the W. he will see Cape Agulhas and the Cape of Good Hope, which rises 840 ft. above sea level. If the traveller doubles the Cape, he will find himself in Table Bay, above which towers the flat-topped, cloud-girt Table Mt (3582 ft.). Cape Town, the cap. of the prov., extends along the coast and the lower slopes of the mt. on the side of the peninsula opposite False Bay, which lies on the S. So far the shore has been fertile and well watered, and the scenery often picturesque, but along the W. the coast is covered with white sand and scrub, and presents a barren aspect. Saldanha Bay,

20 m. N. of Dassen Is., is a safe and sheltered roadstead. Robben Is., outside Table Bay, is the only other is. of importance, and is fortified by the Brit. Gov. as a naval base.

Ocean currents. The Agulhas current rushes south-westward from the S. and E. coasts so forcibly that a counter-current, running in a north-easterly direction, is set up. Ships going towards Natal from Cape Town avail themselves of this back drift. At the S. extremity the warm Agulhas current meets the cold W. drift from the Antarctic. The current flowing northward along the W. shores is really part of this W. drift, though its course is diverted.

Rivers. Beginning on the E. coast the Buffalo rises beyond King William's Town, which is on its bank. At its mouth lies E. London, the third port of the prov. Port Alfred is situated at the mouth of the Kowie, which rises in the Zuurberg Mts. and is noted for the beautiful country through which it flows. The source of the Kei is in the Stormberg. Further S., the Great Salt R. enters the sea. It is formed by the flowing of the Kat, which rises in the Winterberg, into the main stream, there called the Great Fish R. Rising in the Zuurberg, the latter, like the Sunday and the Grootte, crosses the Great Karroo; it is remarkable alike for its swollen waters after rains, and for its tortuous course. At one time it makes a great circular sweep of 20 m., the 2 ends being less than 2 m. apart. The Sunday joins the Indian Ocean in Algoa Bay after watering a very fertile dist. The Grootte is the more important of the 2 streams which are known after their junction as the Gamtoos. It takes its rise, like the Gamka, in the Nieuwveld Range. The Gamka unites with the Olifants to form the Gouritz, which is fed by the trib., Grootte (125 m.), just before it pierces the coast range. The most westerly riv. of importance on the S. coast is the Breede, which rises in the Warm Bokkvel. Breaking through the mts at Mitchell's Pass, it afterwards receives the streams from the celebrated Hex R. Pass. On its banks are the picturesque tns of Ceres and Worcester. Unlike most of the rivers, whose mouths are silted by sand-bars, it is navigable for some 35 m. There are 3 rivers flowing into the Atlantic Ocean N. of Cape Town, namely the Berg and the Buffalo, each 125 m. long, and between them the Olifants, 150 m., which, rising in the Winterhoek Mts and cleaving a passage between the Cederberg and Olifants chains, maintains a fair depth throughout its lower course. The great waterway of the Orange, which stretches almost from the Atlantic to the Indian Ocean, forms a N. boundary to the prov. The Zink, Ongrers, and Brak unite with the middle courses of this riv., whilst the united Modder and Riet from the SE. and the Harts from the NE. both effect their junction with the Vaal, the greatest of the Orange offshoots, within the confines of the colony. The inner mt range is the main watershed. Unfortunately hardly any of the rivers are navigable for any distance. As they

tear down the mt sides, cutting deep ravines, they grow into splendid streams after heavy rainfall, but in the hot weather they shrink to the size of brooks or dry up altogether.

Though the prov. has no lakes, there are many 'salt pans,' the largest being Commissioner's Salt Pan, some 20 m. in circumference. Situated in the barren NW. flats, this natural basin. Like the rest, rapidly loses its waters in the dry season, so that the salt layers at the bottom may be reached. Near Knysna and elsewhere are shallow basins, called *vleis*, which overflow into one another in time of flood. These pools vary in

portion being occupied by the Stormberg peaks and the N. by the flanks of the lofty Drakensberg. The central range E. to W. includes the Zuurberg, Winterhoek, Grootte R., Grootte Zwarteberg (greatest elevation 6989 ft), and the Cedarberg Mts. Great gorges called kloofs have been pierced in this chain by the rushing streams. The third mt rampart, running 120 m. inland from the shores, is variously named the Nieuwveld, Sneeuwberg (in which is Compass Berg, attaining the greatest altitude in the prov., 8500 ft), Zuurberg, and Stormberg ranges. The E. coast is flanked by the Roggeveld and Komsberg Mts, which continue the



THE CAPE OF GOOD HOPE

bulk according to the humidity of the atmosphere.

Mountains and tablelands. For the most part the 3 mt chains are well defined and their configuration is simple to grasp, since they follow the coastlines. Beyond the coast plain, which rarely rises to 600 ft, the abrupt S. slopes of the coast range ascend to a plateau some 30 m. wide, known as the Little Karroo (Hottentot for arid). The terraced formation is continued by the second chain of mts, which give on to the Great Karroo, a tableland whose area is something like 28,000 sq. m. The main belt of heights, shutting in this plateau to the N., fringes the immense plain of S. Africa, only a strip of which lies in this prov. Thus in spite of a perplexing nomenclature, the structure of the high lands is plain. Passing E. to W. the coastal chain is known successively as the Uiteniquas, Langeberg, Zondereinde, Drakenstein, and Olfants Mts. The prov. E. of the Kei R. is very hilly, the S.

Nieuwveld. It is true that the contours of the mts are often imposing, yet these hardly compensate for the monotony of the bare stretches of veld, and for the marked deficiency in water and trees. The flowering shrubs and grasses have no sooner sprung up on the Bushmanland plateau (in the NW.) than they are withered away by the hot suns, which undo the fertilising work of the heavy rains. Cattle, however, often find good pasture by the *vleis*, if the soil is not too brackish. The vast, treeless tableland to the N., whose average altitude is 3000 ft, is broken only by the great Orange R. which cuts across its whole length.

Geology. The geological structure of the mt ranges is fairly uniform, most of them consisting of huge masses of quartzose sandstones on granite bases. Whilst the granite when it occasionally crops out has rounded contours, the formation of the sandstone, as on Table

Mt. is flat. The latter often covers the primitive rock to a thickness of 1750 ft. The Stormberg chain alone presents traces of recent volcanic action. Ferruginous reddish sands and argillaceous clays, resting on blue slaty rock, form the surfaces of the karroos and N. plateaux. The 3 systems are known as the Cretaceous, Karroo, and Cape systems, whilst there are also pre-Cape rocks that are little understood.

Climate. The climate of the prov. is healthy. As a rule the air is remarkably dry and clear. The mean ann. temp. may be taken as less than 65° F., although the daily range is considerable, the average variation on the Karroo being as much as 27° F. The drawback is the prevalence everywhere of dust, which is blown by every wind. The climate mainly depends on 2 factors: the elevation of the land and the expanse of ocean in the lower hemisphere. It is the cold currents of the latter which give to Cape Town as low a mean temp. as 63° F., the same as that of the It. Riviera, which is 8° farther from the equator. The mt. chains exhaust the rains of the moisture-laden winds from the E. and SE. Thus these winds fertilise in plenty the coastlands, but, as the more they advance into the interior the drier they get, most of the prov. is subject to frequent drought. Along the W. coast, N. of the Olifants, rain does not fall for years together. A line from Walvis Bay to Port Elizabeth, on the SE., roughly divides the prov. W. and E. into the areas of winter and summer rainy seasons respectively. W. of 23° E. the mean ann. rainfall is under 10 in. By the W. coast and on the Little Karroo it varies from 10 to 20 in., but on the S. and SE. coasts it is over 25 in., and in the Cape peninsula sometimes rises above 40 in. The thunder-showers which usually follow the dry hot N. wind from the desert are the one source of rainfall to the arid N. dists. Dec. and Jan. are the hottest months, and June and July the coldest. On the N. plateaux and on the Karroo the mean minimum temp. is 49° F., and the mean maximum 77°. Though the hot westerly winds make the daytime often oppressive, the nights are cool and refreshing. Frosts are frequent in the winter, and whilst snow rarely falls on the coasts, it often caps the high mts for months together.

Flora. Along the coast the flora is rich. Of the 10,000 varieties of species, some 450 are found only in the prov. Prickles and thorns are common characteristics of the plants. There are over 400 genera of the bushes and heaths; the abundant pink *roenoster* bush is not unlike heather. Aloes, 'everlasting flowers,' and the castor-oil plants are also indigenous. Among flowers the iris and arum lily are conspicuous, whilst the spurge plants, the elephant's foot, and the stapelia, or carrion flower, may be noted among plants structurally eccentric. Forests of trees rarely more than 30 ft high cover some 550 sq. m. of the S. seaward slopes. The yellow-wood (of the yew species), the silver-tree, black ironwood, the

melkhou, and the heavy, hard stinkwood are indigenous, whilst oaks, which grow luxuriantly, pines, and poplars have been introduced with success by settlers. Though the native fruits, including gourds, water-melons, and hard pears, are rare, most of the varieties introduced from other countries grow well. In the spring the blossoms of the dwarf mimosa on the Karroo are splendid. A coarse yellow grass covers the tablelands of the interior.

Fauna. The fauna is varied, though lions and rhinoceroses have been expelled and the blaauwbok and quagga exterminated. Zebras, elands, antelopes, gnus, buffaloes, and elephants now require special protection. Not so the silver jackal, wild cats and dogs, aard-wolf, and hyaena, which are still fairly common. Springboks herd on the open veld, whilst other species of Ungulata are the steinbok, the klipspringer, and the dassie rabbit. There are also baboons, otters, pangolins, and other ant-eaters, mongooses, jorboas, and hares. Among reptiles may be mentioned puff adders and other snakes, lizards, and tortoises. There is a great variety of game birds, including the ostrich, the huge kori bustard, the quail, teal, snipe, widgeon, and many others. Eagles, falcons, owls, and aasvogels, besides flamingoes, pelicans, and cranes, are also found. Most of the birds belong to the Passerco order. Larks, weavers, and starlings—the Eng. starling is the only naturalised European bird—are the commonest varieties. Of native insectivora, the 'golden mole' is notable for the splendid lustre of its yellow fur. Jumping shrews, tarantula spiders, scorpions, toads, and frogs are also native to the prov. The large baba and yellow-fish occur in fresh water, whilst in the sea are found seals, sharks, whales, steenbrass, snoek, and many edible species.

Agriculture and allied industries. Artificial irrigation is much needed to promote the cultivation of large tracts of land, whose one deficiency is water. Mealies (Indian corn), oats, wheat, barley, and rye yield good crops. The vegetable produce consists chiefly of potatoes, mangolds, peas, and beans. Most of the farmers live by sheep-rearing, the number of sheep in the prov. amounting to nearly 31,000,000; of cattle there are over 3,600,000, and of goats 5,000,000. The number of domesticated ostriches on the farms had declined in 1955 to about 40,000, showing a very considerable decrease since 1912, and the total to-day is even below that figure. Oudtshoorn was, and still is, the great ostrich farming centre of S. Africa, but the industry was at its peak from 1906-12, when there were 400,000 birds in that dist. alone. By 1939 the number had dropped to fewer than 20,000, and feathers, which had previously sold at any price from £20 to £100 per lb., sold at no more than 22s. per lb. Mules are bred on the veld. In the W. dists. of the Cape the vine is grown and produces an abundance unknown in other countries. There is only a limited demand for the Cape wines in Europe in spite of the fine flavour of the

grapes. The export trade has, however, improved. The tobacco crop is becoming increasingly important, and cotton, also, is grown. Great improvements in transport have made it worth while for fruit-growers to cultivate grapes, apricots, oranges, and peaches for foreign markets. The ann. harvest of each fruit runs into millions, and S. Africa supplies the Brit. market with fruit of all kinds during the winter months. Great quantities of wheat and maize are annually ground in the flour-mills, which are second only in importance to the diamond mines as a source of industrial wealth.

Mining. The diamond mining is carried on in Kimberley, which yields more diamonds than all the other mines combined, Hopetown, Griqualand W., and other places near the Orange R. Up to the end of 1952, the total value of diamonds mined in S. Africa was £394,691,116. The industry was severely hit by the First World War, when many of the mines closed down, and there was another serious slump in 1921. Diamond output is, however, now controlled by an agreement fixing quotas of members of the Diamond Producers Association. There are a number of collieries in the Stormberg dist., and copper, gold, tin, and salt are also found.

Trade. Since the Union of S. Africa came into effect, no complete record of the trade of the separate provs. has been kept, but it is estimated that the value of goods sent from the Cape to the U.K. has averaged annually some £14,000,000 in the past decade. Goods imported from the U.K. were valued at an equivalent amount. Transit of goods to and from the Transvaal and other parts of the Union considerably augments the commerce of the prov.

Posts and telegraphs. Besides a well-organised postal service, the prov. is connected with Europe by 4 distinct cable routes, is in complete telegraphic communication with all the S. African provs., and has estab. within her own boundaries an excellent telegraphic system under state control. A telephone service has been instituted in the tns. The prov. is also in wireless communication with the U.K.

Railways. The railways are owned by the state. The first was built in 1859 from Cape Town to Wellington as the result of private enterprise, but in 1871 Parliament began to construct railways at public expense. The Western, Midland, and Eastern are the 3 chief systems. Of the first system the main line runs from Cape Town through Kimberley, Vryburg, Mafeking, Bulawayo, and the Victoria Falls (1623 m.) on to the Belgian Congo frontier. Branch lines connect Cape Town with Johannesburg, Pretoria, Salisbury, and Beira (2037 m.). The terminus of the Midland system is Port Elizabeth. The main line passes through Cradock and Naauwpoort to Norval's Pont, and thence is continued to Bloemfontein, Johannesburg, and Pretoria. The Midland and Western systems are connected by branch lines at De Aar. The Eastern system runs from E. London

to Springfontein (314 m.), which is a junction for the Bloemfontein railway. A series of railways crosses the prov., running E. and W. parallel to the coast. There is a total mileage in the prov. of over 5000 m. The S. African Railways Administration operates an extensive network of road motor services in rural areas and as feeders to the railway. Route mileage (1954) totalled 27,163 m.

Other communications. The W. route to the Cape is via London or Southampton to Cape Town, the E. is via the Suez Canal and Natal. There are steamer connections too with Australia and India, and Cape Town may also be reached by air, Wingfield airport being situated 6 m. from the city.

Races and population. Of the 2 indigenous tribes, the Bushmen (q.v.) and the Hottentots (q.v.), the former have retreated before the settlers and have been much reduced in number, and the latter have been absorbed into the Cape Coloured Community. The Kaffirs come from the Bantu negroid stock, their chief tribes being the Bechuanas, who live N. of the Orange, and the Fingoes, Tembus, and Amaxosa. The Griquas are half-castes of Dutch-Hottentot blood. A number of Malays, whose bond of union is their Muslim religion, have settled round Cape Town. In 1951 the white pop. was 935,674; Bantu, 2,483,652; coloureds, 980,456; Asiatics, 16,548. Notwithstanding the great numerical superiority of the coloured races, in the SW. corner of the prov. the white pop. is actually numerically the stronger. Only a very small proportion of the people live any distance inland. The majority of the coloured pop. is engaged in agric. or domestic employment. Since early years there has been a steady stream of immigration. In 1903, after the Boer war, the number of immigrants was phenomenal, namely 61,870, that is, 30,000 more than the emigrants. But in 1905 the outgoing figures (34,533) were actually more than those of immigration (33,775), and the number of immigrants continues to be low.

Chief towns. The cap. of the prov. is Cape Town (q.v.). Kimberley, Port Elizabeth, and E. London (qq.v.) come next in importance as seaports. In the W. half of the prov. the chief tns are Paarl, Mossel Bay, Oudtshoorn, Worcester, George, Graaf Reinet, Cradock, Middelburg, Caledon, Malmesbury, Wellington, Stellenbosch, and Beaufort W. (qq.v.). In the E. half the most important tns are Uitenhage, Grahamstown, Queenstown, King William's Town, Aliwal N., (qq.v.), and Somerset E. Simonstown (q.v.) is a naval station which has large docks.

Religion. Of the European pop. (1946 census) the Dutch Churches claim 1,201,936 adherents and the Anglican 374,625. Other denominations: Methodists, 181,008; Rom. Catholics, 117,890; Presbyterians, 94,830; Baptists, 23,532; Lutherans, 22,669; Congregationalists, 12,677; Christian unspecified, 22,000. There were 104,156 Jews and 6500 unspecified.

Education. There is a state system of free primary education, which is compulsory for white children. School boards and school committees conduct the local school administration, the prov. being divided into 111 school dists. There are special day and industrial schools for the natives. The elementary schools are undenominational. There are 3 univs. in the C. P. for Europeans: Cape Town, Stellenbosch, and Grahamstown. There is a univ. college at Fort Hare for Bantus.

Law. The administration of justice is well systematised. What was the supreme court of the Cape became, like those which sit at Kimberley and Grahamstown, a local div. of the Supreme Court of S. Africa after the Act of 1909.

History. The hist. of the prov. of the Cape of Good Hope falls easily into 2 sections, with 1814—the year when it was finally recognised as an Eng. colony—as the dividing line. Two Portuguese, Bartholomeu Diaz (in 1486) and Vasco da Gama (1498), were the first explorers to round the stormy Cape. Though from that time onward Portuguese, Dutch, and Eng. traders rarely went to the E. by the Cape route, a first definite step towards acquisition was taken by the Dutch E. India Co. in 1652, when it estab. a fort at the foot of Table Mt. and made a small settlement, with the object of ensuring a fresh-water supply for its merchant vessels in their passage to the E. Indies. But the company was early induced to cultivate the fertile earth and to found a colony as well as a water station. Unfortunately, it did not encourage individual colonists to co-operate, with the result that the latter sent home many protests against its jealous monopolies—protests, however, which proved quite unavailing. When France seized Holland, the latter appealed to England for help. The effect of this at the Cape was that an Eng. force held the colony in trust for the mother country till the peace of Amiens (1802), when it was given back. After about 4 years' rule, under state administration this time, instead of the company's, an Eng. force (about 4000 strong) was again landed in the colony to forestall any efforts the common enemy, France, might make to capture so prosperous a land. Gen. Janssens, the Dutch general, was obliged to capitulate. Thus, after a military occupation which extended over some years, the colony was recognised by the European powers as a Brit. possession. Once the company with its narrow, selfish ambitions was removed, agriculture and industries, especially sheep-rearing for wool, advanced by leaps and bounds. But in the course of its rapid development the colony encountered other disturbing forces. It happened that the native Kaffir tribes were expanding southward at the same time that the colony was pushing N. The contact of Kaffir and colonist led to a series of wars, the obvious cause of which was the cattle-lifting propensities and the predatory habits of the former. But the wars were really an expression of the inevitable conflict between tribal laws and European administration, a conflict which

allowed of no settlement by compromise. The disastrous battles at last brought home to the Eng. Gov. the need for controlling native ters. by imperial administration. This was actually carried into effect by the Scanlen ministry. Paternal gov. of the natives outside the colony was substituted by the Upington-Sprigg ministry. Jameson, who was a doctor at Kimberley, in 1896 made an unsuccessful raid into the Boer ter. of the Transvaal. The colony, especially Kimberley, played an important part in the S. African war (q.v.) (1899–1902), but the Cape rebellion ended early in 1900. Cecil Rhodes, who was Prime Minister of the colony from 1890 to 1896, pursued an imperial policy in sharp contrast to that of the Bond party. The latter, stimulated by the active encouragement of the famous Afrikaner Bond, hoped in vain to establish a Dutch rep. See SOUTH AFRICA, UNION OF.

Constitution. The constitutional development of the colony was much more rapid than in the older countries. As in the first instance the governors of the colony were autocrats, it was a fortunate thing that many of them proved men of ability and public spirit. The first Executive Council was called in 1825, and 10 years later the first Legislative Council, one half of which was nominated by the governor, the other by the Crown from its officials. In 1853, at the instance of the council and with Crown support, a House of Assembly and a Legislative Council were conceded to popular wish. Finally, responsible gov. was put altogether in the hands of the colony in 1872. As early as 1829 it was decreed that men of all nationalities were to enjoy alike the advantages of the common law, and every slave was emancipated in 1838. By the South Africa Act of 1909, the colony entered the Union of S. Africa, sending 51 representatives to the House of Assembly and 8 to the Senate. Its former constitution was naturally revoked. A prov. council, elected for 5 years, consisting of 61 members, and presided over by an administrator appointed for 5 years by the governor-general, and an executive committee of 4 members control local taxation and all matters that concern the prov. only.

The Cape native franchise. When in 1902 the Brit. Gov. annexed the Boer reps. the terms offered included not only the promise of self-gov., but an assurance that no native franchise would be given until this had been attained. It was conceded, however, that political union implied a unified native policy, and a Native Affairs Commission, appointed in 1903, investigated (*inter alia*) the question of the franchise. The commission found that in the Cape there were 8117 registered native voters out of a total electorate of 135,168 and that in 7 constituencies out of 46 the native vote could determine the issue of an election. The commission concluded that this was a dangerous position and therefore proposed the creation in each colony of S. Africa of native constituencies in which Africans

should vote separately from Europeans. In 1908-9, when the National Convention met to decide the Constitution of the Union, the Cape delegation proposed a uniform franchise dependent upon a civilisation qualification, which would have admitted some natives, but the delegations from outside the Cape preferred the abolition of any native franchise. It was eventually decided to retain the then existing position, the Cape franchise being 'entrenched' by the provision in the South Africa Act that it could be modified only by a two-thirds majority of both Houses of Parliament sitting together. The right of natives to sit in Parliament, which had been implicitly theirs in the Cape, was now withdrawn. The question of the franchise was raised anew as an element in the policy of racial segregation when the National Party came into power in 1924, but a Bill for the abolition of the Cape franchise failed to secure a two-thirds majority. The attack on the native franchise (then 2/7 of the Cape electorate and 1/2 of the Union electorate) was renewed in 1934-5. The fact that the policy of segregation was already effective throughout the Union was a strong argument for the separation of the natives from the European electorate. The Representation of Natives Act passed in 1936 provided (*inter alia*) that the Cape and Transkei should be separately represented. The Act as originally introduced would have abolished the Cape native franchise but in its final form it made a compromise: it maintains the Cape native franchise but provides for separate election by the Cape native voters of 3 members of the House of Assembly and 2 members of the Prov. Council, who are additional to the existing members and hold office for 5 years irrespective of a dissolution. In 1950 the Separate Representation of Voters Act created separate electoral rolls for the White and Cape Coloured (mixed-blood) voters. See also SOUTH AFRICA, UNION OF.

See G. W. Stow, *The Native Races of South Africa*, 1905; S. Playne, *Cape Colony: its History, Commerce, Industries, etc.*, 1912; O. F. Mentzel, *Description of the Cape*, part 1, 1921; part II, 1925; G. Botha, *Social Life in Cape Colony in the 18th Century*, 1927; W. M. MacMillan, *The Cape Colour Question*, 1927; P. S. du Toit, *Underways in Kaapland*, 1940; A. W. Wells, *South Africa: a Planned Tour*, 1956.

Cape River, otherwise known as *Coco*, *Segovia*, *Wanks*, *Yare*, or *Oro*, rises in Nicaragua. It forms the boundary between Nicaragua and Honduras. It is 300 m. long and flows into the Caribbean Sea at Cape Gracias a Dios. Navigable for 140 m. and adequate for timber floating, though its mouth is impeded by a sand-bank.

Cape Sable Island, situated at SW. extremity of Nova Scotia. C. S. is the most southerly point.

'**Cape Times**', independent Eng.-language morning newspaper, pub. in Cape Town, its circulation covering the whole of the W. Cape. Estab. in 1876, it is the

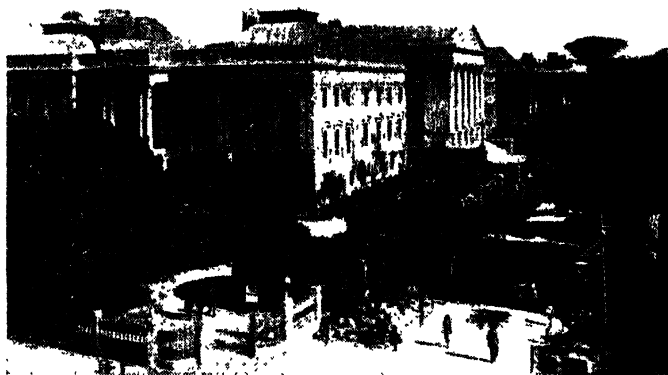
oldest daily newspaper in S. Africa, with national and prov. coverage and an extensive overseas cable service. Its weekend ed. is very popular.

Cape to Cairo Railway. Cecil Rhodes evolved the scheme of running a railway right from end to end of the continent of Africa, traversing Brit. ter. as much as possible and acting thereby as a connecting link between all Brit. possessions in Africa. The distance between Cape Town and Cairo is about 5000 m. The first passenger train arrived at the Victoria Falls on 22 June 1904. At this spot the Zambesi R. is spanned by a steel cantilever bridge, which is 380 ft above flood water, and the highest bridge in the world, the next being the Viaduct du Viar in France, that being 375 ft. In the year 1910 the railroad from Cairo had reached Sennar, except for the riv. gap between Aswan and Wadi Halfa. This was a length of line of about 1000 m. The line from the Cape had by 1906 reached Broken Hill, a length of 2017 m. Changed political and economic considerations make it unlikely that the railway gap will now be closed, but the existing sections in the Union of S. Africa, the Rhodesias, and the Belgian Congo carry an ever-growing volume of both internal and through traffic resulting from the rapid development of those countries. The northernmost point which may be reached directly by rail from Cape Town is Port Francqui in the Belgian Congo, a distance of 3287 m.

Cape Town, or *Kaapstad*, seaport, the legislative cap. of the Union of S. Africa, seat of the Cape Prov. Council, and the metropolis of S. Africa; it is 6008 m. distant from Southampton (transit by mail steamship 13-16 days, and by aeroplane 2 days). It is situated on the N. side of the Cape peninsula in the SW. of the prov., on Table Bay, and at the foot of Table Mt, 30 m. N. of the Cape of Good Hope. The central portion lies in an amphitheatre, which extends down to Table Bay towards the NE. and is backed on other sides by the precipitous face of Table Mt (3582 ft) and its outlying masses, Devil's Peak on the E. and Lion's Head and Signal Hill on the W. This part of the city is built on the slopes at the foot of these mts and extending down to the shores of Table Bay. Table Bay is not a good natural harbour, being exposed to N. and NW. gales. But the modern Duncan dock, together with other enclosed and protected areas, covers 365 ac. Entrance depths to the harbour are 38-40 ft; harbour facilities rank with the world's finest. The tn is the terminus of sev. railway lines. It was laid out after the Dutch fashion with geometrical precision, is well drained and paved, and has a good water supply coming from Table Mt, and a most up-to-date transport system. The chief buildings are the 2 cathedrals, Anglican and Rom. Catholic; sev. Muslim mosques; the S. African College; the museum and public library (the gift of Sir George Grey); the observatory (1820); the castle (a fort 400 years

old); the Houses of Parliament; Government House; the buildings of the univ. of the Cape of Good Hope (1873), which is an examining body only; these are on a splendid site on the Groote Schuur estate, Rondebosch; and the botanic gardens. The city hall can accommodate 6000 people, and the Dutch Reformed church, the earliest edifice for public worship in S. Africa, 3000. Since 1910 the Union Parliament has met in a new wing added to the original Houses of Parliament. The Gov. Gardens, containing a fine oak avenue, serve as a public park. Some fine old buildings of the Dutch

city in the world. It has become a recognised health and holiday resort. The public library contains 150,000 vols. In the S. African Museum are a number of 'post office stones' beneath which captains of ships outward bound placed their letters for conveyance home. In the Jewish synagogue, which cost £40,000, is a memorial to local Jewish victims of the First World War. A striking war memorial and a memorial to Capt. Scott, who perished in the Antarctic, are near the entrance to the pier, which was completed in 1914 at a cost of £85,000 and is 1800 ft in length. Pop. (1951): Whites,



CAPE TOWN: PARLIAMENT BUILDINGS

period still survive, the chief being the castle, begun in 1666, and to-day the oldest building in S. Africa; and the Koopman de Wet Museum, a Dutch house of the early 18th cent., containing specimens of old Dutch furniture and antiques. C. T. has a modern and well-equipped aerodrome, Wingfield Airport, 6 m. from the centre of the city. There are numerous fine and populous suburbs, including Green Point, Sea Point, Woodstock, Maitland, Mowbray, Rosebank, Rondebosch, Newlands, Claremont, and Wynberg. A chain of well-armed forts extends along the shores of Table Bay. The climate is somewhat similar to that of the Riviera, the mean ann. temp. being 63° F. (Jan. 69.9° F., July 55.1° F., with a maximum of 102° F. and a minimum of 34° F.). The mean ann. rainfall is 24.8 in. The city, which is an important port of call, was founded by the Dutch in 1652. It is perhaps the most beautifully situated

267,212; Coloured, 297,645; Bantu, 59,893; Asiatic, 8237.

Cape Verde, most westerly cape in Africa, situated in Senegal. It was discovered in 1443 by Nuno Tristão.

Cape Verde Islands, archipelago, in the possession of Portugal, in the Atlantic Ocean, off the W. coast of Africa, about 300 m. W. of Cape Verde. The is. may be divided into 3 groups: 1. The W. Windwards (Barlavento), comprising Santo Antão (246 sq. m.), São Vicente, Santa Luzia, São Nicolao and the small is. named Branco, and Razo. 2. The E. Windwards, comprising Sal and Boa Vista. 3. The Leewards (Sotavento), comprising Maio, Santiago (São Thilago) (396 sq. m.), Fogo, Brava, Grande, and Bombo. The total area is about 1516 sq. m., and 10 of the is., the chief being Santiago, Santo Antão, Fogo, Brava, and São Nicolao, are inhabited. The is. are all mountainous and largely of volcanic

formation, but some anct granites and gneisses point to a continental origin, and on some is., as Maio, there are sedimentary deposits. The main peaks are the volcano of Fogo (8800 ft.), which was active in 1847; the Pico da Antonia, on Santiago (7380 ft.); and the Pão de Assucar, on Santo Antão (8000 ft.). The climate is tropical, though tempered by sea breezes. There is only a short rainy season in Aug. and Sept., and much distress and famine are caused by drought. The soil is not very fertile, and trees are especially rare, but coffee, sugar, maize, corn, beans, oranges, grapes, peanuts, cacao, cotton, tobacco, cinchona, and indigo are grown and exported. Cattle-rearing is carried on, and the coasts abound in turtles. The inhab., mainly Negroes and mulattoes, speak a debased Portuguese. Porto Grande, on São Vicente (20,000), is a coaling station. The cap. is Praia (6000). The Portuguese discovered the is. in 1441-56. Total pop. 147,331 (1950): 103,251 mulattoes; 42,082 Negroes; 2913 Europeans. See A. Lyall, *Black and White make Brown*, 1938. An ann. pub., *Anuário Estatístico de Cabo Verde* (Praia), is obtainable in Lisbon.

Cape Violet, see IONIDIUM.

Cape Wrath, see WRATH, CAPE.

Čapek, Karel (1890-1939), Czech author and playwright, b. Malé Svatonovice, Bohemia. Became famous in 1920 by his play *Rossum's Universal Robots* (or *R.U.R.*), which added a new word to the world's vocabulary, a robot being an automatic servant or workman. Another successful play of his was *The Macropulos Secret*, and in 2 others he collaborated with his brother Josef—*Adam the Creator* and *The Life of the Insects*. His last play, *Power and Glory* (*The White Scourge*), is anti-war propaganda and was performed in London in 1938. His reputation as a dramatist gave wide circulation to his novels, which show traces of the influence of H. G. Wells, especially *The Factory of the Absolute*, *Krakatit*, and the clever satire *War with the Neutts*, 1937. In fiction he wrote a trilogy forming a convincing picture of Slav peasant life: *Hordubal*, 1934, *Metcor*, 1935, and *An Ordinary Life*, 1936. His other pubs. include travel books: *Letters from Italy*, 1923, and *Letters from England*, 1926, a witty description of Eng. life; *Travels in the North* (self-illustrated), 1939; short stories, essays, and fairy tales: *Money*, 1929, *Tales from Two Pockets*, 1932, *Fairy Tales*, 1933, *The Stolen Cactus*, 1937, and *The Gardener's Year* (illustrated by his brother), 1929. His stories are often very poignant and many have been trans. into English. In *President Masaryk tells his Story*, 1929-1931 (Eng. ed., 1934), he records his appreciation of the statesman whose liberalism he fully shared. C. is the best-known Czech author abroad. See O. Elton, in *Essays and Addresses*, 1939.

Capell, Arthur, 1st Baron Capell of Hadham (c. 1610-49), Royalist soldier, created a baron in 1641. He acted as the king's lieutenant-general in Cheshire and N. Wales. He became one of Charles I's

most trusted adherents, and accompanied the queen to Paris in 1646, and helped Charles to escape from Hampton Court in the following year. He surrendered after Colchester, 1648, and was imprisoned in the Tower, but escaped, was rearrested, tried, and beheaded.

Capell, Edward (1713-81), Shakespearean critic, b. Troston Hall, near Bury St Edmunds. Educ. at Cambridge, he lived mainly at Haslings and in London, where he was deputy-inspector of plays from 1737. His ed. of Shakespeare in 10 vols., with introduction, appeared in 1767-8. The complete ed. in 3 vols. of his *Notes and Various Readings to Shakespeare* was first pub. in 1783 after his death.

Capella, or Capra, star of the first magnitude (0.2) in the constellation of Auriga, of which it is the brightest. It has a companion, magnitude 9, at a distance of 158". In 1899 the astronomers Campbell and Newall discovered it to be a spectroscopic binary, the components revolving round each other once in 104 days. The luminosity of C. is at least 100 times as great as that of the sun. Proper motion 44" a cent.

Capercallize (Capercally or Capercaille are variants in spelling, the *z* being pronounced *y*), or *Tetrao unogallus*, species of genus of the family Tetraonidae, and is the largest gallinaceous bird of Europe. Also called wood-grouse, or cock of the woods, the latter a trans. of Gaelic *capull coille*. The C. is about the size of a turkey and resembles the blackcock in appearance and polygamous habit; the general colour of the male is blackish-grey above, black below, with dark green chest, while the female is smaller, mottled, and has a reddish breast barred with black. The feathers on the legs and feet are longest in winter time, and the toes are quite naked. At breeding-time the male indulges in curious love-songs and antics to attract a mate, and fights between rival cocks are of common occurrence. The food of the birds consists of insects, worms, berries, and young pine-shoots. The C. is widely distributed in countries where pine forests abound; at the end of the 18th cent. it was exterminated in Scotland, but in 1838 it was successfully reintroduced. See J. G. Millais, *Game Birds*, 1892.

Capernaum, anct city usually identified with the modern Tell Hum, on the NW. coast of the sea of Galilee, but occasionally with Khan Minieh, a little further S., Am Tabigha, or Kherase, all of which are within a few m. of each other. Christ made C. the centre of his Galilean ministry and preached there his great discourse on the Manna and the Bread of Life. See H. V. Morton, *In the Steps of the Master*, 1949.

Capers, see CAPPARIDACEAE.

Capesteire, or Le Marigot, tn in Basse-Terre is., Guadeloupe, Fr. W. Indies, 12 m. ENE. of Basse-Terre. Pop. 12,350.

Capet, family name of the third Fr. dynasty, founded by Hugh C. (q.v.). This family ruled France in a direct line from 987 to 1328.

Capet, Hugh (c. 940-96), King of

France, son of Hugh the Great, Count of Paris. In 987, on the death of Louis V, the last of the Carolingian line, he seized the Fr. crown and founded the third, or Capetian, dynasty. He was accepted by most of the nobles, but his claim was contested by Charles of Lorraine, the rightful heir of Louis V, whom, however, he defeated. He rallied the great nobles round him as grand vassals, and feudalism became a recognised part of the constitution. He also estab. hereditary succession to the monarchy, and made the king's eldest son 'master of the palace.' He was succeeded by his son Robert.

Capgrave, John (1393-1464), Eng. theologian and historian. He was b. at Lynn and became an Augustinian friar. He wrote Bible commentaries in Latin and, in English, *The Chronicle of England*, from the Creation to AD 1417, and a metrical *Life of St Catherine*.

Capias (Lat. 'you may seize'), term once used in legal practice to denote writ directed to the sheriff, commanding him to arrest some person named in the writ to come up for judgment, discharge a fine, or perform some other legal obligation. The writ of attachment for contempt has replaced the old C. for all practical purposes.

Capillarity, phenomenon which occurs when a fine tube, open at both ends, is placed vertically in a liquid; the surface of the liquid within the tube is either above or below the surface outside. The condition is only observed when the diameter is small, hence tubes which exhibit this property are called capillary or 'hair-like' tubes. A similar effect is produced when 2 glass plates are held vertical and parallel a short distance apart in a liquid; the liquid forms a film between the 2 plates. If the plates are pulled gently apart at 1 side so as to form a very acute angle, the surface of the contained film presents a curve (an equilateral hyperbola), having its greatest distance from the free surface of the liquid at the point of the angle. Thus C. diminishes as the distance between the walls increases, the ascent between smooth glass plates being, however, only one-half of the ascent in a tube of the same diameter. Every liquid has at its bounding surface between it and another medium (say air or glass) a surface tension, or tendency for the surface to withdraw itself into the smallest possible area. In small amounts of liquid, this tendency is sufficient to overcome the effects of gravity; thus a minute quantity of mercury becomes on a flat surface a globeule that is practically spherical, whilst a large amount simply shows a convexity at the edges, gravity having produced the horizontal surface that we look upon as characteristic of liquids. In the instances mentioned it should be noticed that there are 3 substances in contact, such as glass, air, and water, and the form taken by the visible fluid surface, i.e. that of the water, depends on the relative attracting power of the 3 substances on each other. Thus whilst water rises in a capillary

tube and presents a concave surface upwards, mercury is depressed and has a convex surface. C. is a widespread phenomenon; oil rises in the wicks of lamps, moisture in the roots and stems of plants, by virtue of C. All substances with pores of sufficient size are capable of sucking up water, e.g. blotting-paper, sponges. See ABSORPTION and SURFACE TENSION.

Capillary Vessels, smallest blood-vessels in the body. The arteries which convey blood from the heart are split up into myriads of branches which vary from a five-hundredth to a three-thousandth part of an inch in diameter. By their means the blood is supplied to every part of the body. The capillaries reunite in the veins, by means of which the impure blood is returned to the heart. See p. 70.

Capistrano, St John of (1386-1456), It. preacher and theologian. b. Capistrano in the Abruzzi. He began his career as a lawyer, and was for some time Governor of Perugia until the death of his wife in 1416. He then joined the Franciscans and collaborated with St Bernardine in advocating the reform of his order. Most of his religious life, however, was spent as papal legate to various states. In that capacity he proved himself a tireless worker in the cause of orthodoxy, opposing the Fraticelli and Jesuati in N. Italy, the Jews of Sicily and Moldavia, and especially the Hussites of Germany and Bohemia. His attitude towards the Hussites has been adversely criticised; he aimed to prevent them negotiating with the Holy See on the ground that such talks were equivalent to condonation of heresy. In 1455 C. enrolled troops for a crusade against the Turks, and his efforts in this direction contributed to the relief of Belgrade. He was canonised in 1724, and his feast is celebrated by the Rom. Catholic Church on 28 Mar.

Capital, in architecture, see COLUMN.

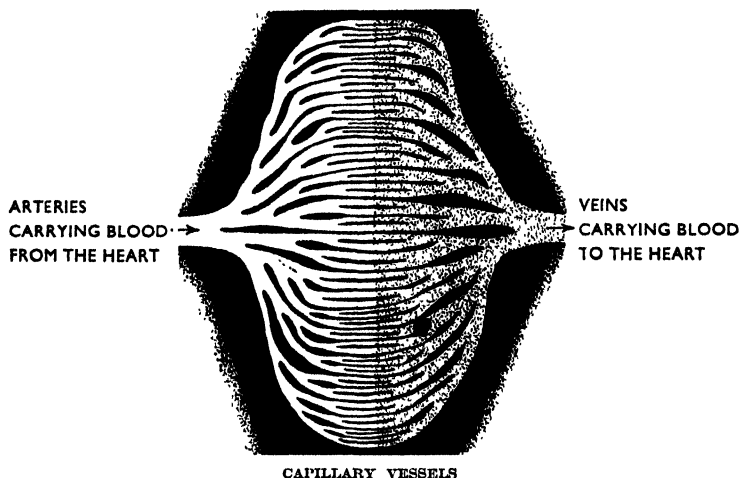
Capital (of a company), see COMPANY.

Capital may be shortly defined as that part of wealth which is accumulated in order to assist future production. In commerce the term is used to express the stock of the manufacturer or trader, used in carrying on his business, in the purchase or manuf. of commodities, and in the payment of wages of labour; in this sense it includes not only money but also buildings, machinery, and all other material objects which facilitate commercial operations. The C. of a country comprises the products of industry possessed by the community, and available for consumption or for further production. C. may be applied either directly in the employment of labour, or indirectly in aid of labour; it may be spent in the food and clothes of labourers, or in tools and other auxiliary machinery, to assist their labour and increase its productiveness. The former is usually termed circulating C. in economics, and the latter fixed C.

C. in social polemics is regarded by some schools of thought as that which is radically opposed to labour. Karl Marx (q.v.), starting from the position that the

economic structure of society, i.e. the method of production and distribution of the products of labour, is the basis upon which everything else—the juridical, the religious, the political, the social life of the people—rests, argued that while political economy was right in holding that the consumption of surplus products by productive labour was a feature of accumulation, it was wrong in holding that all surplus value that was changed into C. became such C. as was represented

and C. combine to create, and that no progress can be made in any sphere of industrial activity without the help of funds controlled by persons who risk them for the sake of progress. From the moment at which a man produces more than he consumes, he is creating C.; and the accumulated surplus of production over the consumption of the whole community is the C. of a country. Those parts of the products of labour which are reserved for the



A diagram illustrating the change from arterial to venous systems in the network of capillaries.

by labour power. With the same critical analysis of prevalent principles of economists, Marx considered that private property, based upon the labour of its owner, had become by the evils of our civilisation replaced by what he termed 'capitalistic' private property, based on the labour of other persons than the owner of the property. Henry George, in *Progress and Poverty*, contended that the wages of labour were paid from the value of that which labour produces, and that therefore labour produced its own remuneration. Opposing theories assert that the accumulated savings of labour and accruing profits constitute a collective abstinence on the part of both capitalist and labourer for the ultimate good of all; and that, because the capitalist postpones or denies himself the present enjoyment of a portion of his means of consumption in the expectation of prospective reward, C. is justified in claiming such reward, whether by way of rent or interest or profit. It is further argued that wages are paid not out of labour but out of C. It may be said that the ultimate source of both wages and profits is the value of that which labour

reproduction of other commodities, and those intended solely for use or consumption, have constituted a distinction amongst economists. Adam Smith classed the one as C. and the other as revenue. Both, however, are generally regarded as forms of C., although it is true that the accumulation of C. proceeds slowly or rapidly in proportion as one or other of these modes of expenditure is most prevalent. As to the relation of profits to accumulated C., John Stuart Mill laid it down that in proportion as C. increases, the rate of profit falls, because the competition of C. with C. is more active than that of labour with labour (*Principles of Political Economy*). It is generally agreed that a high rate of profit is favourable to accumulation; also that rich and populous countries are denied this advantage; that, if they enjoyed it, their C. would continue to increase more rapidly than it does in fact increase; but that, under ordinarily favourable circumstances, the masses of inherited C. and the aggregate savings of vast numbers of capitalists still facilitate accumulation in a greater ratio than the increase of pop., which a high state of civilisation has a

tendency to check. In ordinary parlance C. and money are synonymous; but they are not the same thing. If they were, it would be untrue to say that C. was one of the requisites of the production of wealth, for money in itself does not assist in the production of wealth. It is usual, indeed, to distinguish between the money market and the C. market, the former being concerned with short-term borrowing and the latter with long-term borrowing; in both uses what is borrowed is command over C. in the form of money. See CAPITALISM.



THE CAPITAL 'I' AT THE OPENING OF THE EARLIEST COMPLETE ENGLISH BIBLE, TRANSLATED BY MILES COVERDALE, AND PROBABLY PRINTED IN ZÜRICH IN 1535

Capital (Lat. *capitalis*, pertaining to the head), in typography, larger and differently formed letter placed at the head of a paragraph, at the beginning of lines of poetry, of sentences, of proper names, etc., to help the eye and so facilitate reading. The uncial never used C.s (*majuscula*) and small letters (*minuscula*) concurrently; either all C.s were used or all small letters. All the old MSS. are in C.s alone up to the 7th cent. After this time C.s began to be used only at the beginning of books and chapters; they were often elaborately illuminated and decorated: 'We writeth capital letters with reed colour...' (Trevisa's explanatory notes in Higden's *Polychronicon* i. 129). These illuminated C.s were very much bigger than the small letters, and not, as in ordinary typography, about twice the size. There were 2 chief types of C.—the square and the rustic; the latter were characterised by curves and by finer strokes. C.s are in general use at the present day in nearly all languages, and their use is chiefly to help the reader. In the Ger.

language every substantive has an initial C.; in English C.s were formerly used much more freely than they are now. Adjectives derived from proper nouns, as *English*, *French*, etc., have initial C.s in English, though not in French or German; so also have all nouns and pronouns referring to God. The pronoun I is always written with a C.; the Latins did not think it necessary to write in this way, an I standing alone: the Lat. verb *ire*, to go, had in the imperative *i*, and so it was written. See also MANUSCRIPT.

Capital Account, see BOOK-KEEPING.

Capital Levy. The national debt of the U.K., which had stood at £850 millions at the beginning of the First World War, was more than 10 times as great in 1920, when it reached £7830 millions. The question arose how it was to be paid. The facile idea that the losers of the war should pay all its costs was not treated seriously by economists or statesmen of repute. The debt had therefore to be paid in the main by the Brit. people. A levy upon capital was suggested: a tax levied on (and paid out of) privately owned wealth. The first recorded demand for a C. L. was made by a private member in the House of Commons in 1914. It was put forward in the early days of the war as a 'business proposition,' i.e. as an alternative to a high income tax. But as the war continued so-called ethical factors came into the problem. Firstly, it was said that as 'life' was being conscripted, 'wealth' should be conscripted too; secondly, despite the heavy income-, super-, and excess-profits taxes, enormous fortunes were being made by some, while others were being impoverished. The suggestion of a C. L. at first found some supporters in each political party, and among the Conservatives Bonar Law was said to have had some sympathy with the idea. It remained part of the Labour party's programme until 1927, and was revived at various times thereafter, particularly after the Second World War. It was variously proposed that those whose total net wealth exceeded £5000 should become liable to the levy. This was the figure proposed by the Board of Inland Revenue in 1919 in its scheme for the taxation of war fortunes. This minimum would have exempted small property owners and those then exempt from income-tax, and have brought within the scope of the measure between 300,000 and 400,000 persons. An illustration of the scale of levy proposed in that scheme was that a man worth £6000 would pay £50, or 1.2 per cent of his total fortune; one worth £10,000 would pay £550, or 5.5 per cent; one worth £100,000 would pay £32,800, or 32.8 per cent; and a millionaire would pay £502,800, or 50.3 per cent of his fortune. The Colwyn Committee on Taxation and the National Debt, appointed by the Labour Administration in 1924, rejected the scheme in its report of 1926, and even the minority report of that committee was favourable only to the levy 'provided it were generally approved.' The nearest to a C. L. in Britain came in 1948—the 'Special

Contribution,' a 'once-for-all' levy on capital holdings. See INCOME TAX.

Capital Punishment, punishment by death for crime in conformity with the sentence of a properly constituted tribunal, civil or military. Whatever may have been its origin, whether in feelings of revenge, regularised by the *lex talionis* (the law of 'an eye for an eye and a tooth for a tooth'), or in theories of retribution or deterrence, C. P. is a term opposed to all irregular modes of punishment such as the Amer. 'lynch law,' or any modern survival of 'blood-avengers.' C. P. is so named from the Lat. *caput*, because hanging or decapitation was the most usual mode of C. P. In more primitive societies, when civil tribunals were far from being of certain authority or possessed of adequate machinery for enforcing their decrees, the punishment of murderers or other homicides was, as in the case of most other kinds of criminals, a matter for self-redress. Subsequently, in England during Saxon times, man-slaying became the subject of compounding by the payment of what was known as wergild, or blood-money, the amount of which varied with the degree of importance in the social scale of the murdered person.

There have, in the early hist. of this country, been various forms of C. P. in use, but gradually hanging became the sole accepted form. The offences for which C. P. could be ordered have also varied. During the 18th and early part of the 19th cent., C. P. came to be used with increasing frequency; 156 new offences were made capital between 1714 and 1830. By the latter date there were 220 capital offences. Criticism of this state of affairs was not lacking. Bentham, arguing that the evil of punishment should not exceed the advantage gained by the criminal through his offence, wished to limit C. P. to murder and treason. His views were greatly influenced by Beccaria, whose *Treatise on Crimes and Punishment*, pub. in 1764, had denied that man had the right to punish in this way.

The practical movement for abolition in this country owed its inception to Sir Samuel Romilly, who in 1810 introduced an unsuccessful bill for the abolition of C. P. for stealing 5s. or over from a shop. Opposition was based on the assumption that C. P. must be the most effective deterrent. The Chief Justice of England, Lord Ellenborough, speaking against the Bill in the House of Lords, maintained that 'the expediency of justice and the public security require that there should not be a remission of C. P. in this part of the criminal law.'

On the other hand, at a slightly later date, a group of London bankers petitioned for the abolition of C. P. for forgery, as they held that the law was the reverse of deterrent. Juries were frequently so unwilling to make the accused liable to a death sentence that they brought in a verdict of not guilty contrary to the evidence. This was a state of affairs not limited to the one offence.

The C. P. laws did in practice enable many guilty persons to escape punishment altogether.

In 1832 C. P. was abolished for stealing cattle, etc., and the following year for housebreaking. In 1837 the number of capital offences was reduced to 15, and in 1861 to the 4 offences that still remain capital: murder, treason, piracy with violence, and setting fire to Her Majesty's vessels, arsenals, etc.

Other changes in the law that have occurred since are: 1868, public executions abolished; 1908, C. P. for persons under 16 abolished; 1932, minimum age raised to 18 and in 1948 to 18 at the time the offence was committed; 1922, C. P. abolished in cases of infanticide when the mother has not recovered from the effects of her confinement; 1931, C. P. abolished for expectant mothers.

Although the death sentence has to be pronounced in every case in which a verdict of murder has been brought in by the jury, actually only a small proportion of all murderers are hanged, as the table on p. 73 shows.

The figures in brackets relate to victims under 1 year and are included in the total. The crimes of persons accused of murder but convicted of some lesser offence such as manslaughter are not included.

The question of C. P. has been the subject of various gov. inquiries and parl. debates.

The following are the most important of these:

1. 1930: *Report of the Select Committee of the House of Commons*. This recommended the abolition of C. P. for an experimental period of 5 years in cases tried by the civil courts in time of peace, and that the substituted penalty should be that now attached to reprimed murderers. The recommendations had the support of 8 of the 15 members of the committee. Six of the members withdrew owing to their disagreement with the draft report, but did not produce a report of their own. None of the recommendations was implemented.

2. 1938: *Motion in House of Commons* suspending C. P. for an experimental period of 5 years was carried by 114 to 89. No further action was taken by the gov.

3. 1939: *Amendment to the Criminal Justice Bill* for a 5-year suspension was defeated.

4. *Amendment to the Criminal Justice Bill*, 1948, for a 5-year suspension of C. P. passed in the House of Commons by 245 to 222. The clause was thrown out by the House of Lords and the Bill passed without it.

5. 1949: A Royal Commission was set up to consider whether the liability 'to suffer C. P. for murder should be limited or modified.' A consideration of abolition did not fall within these terms of reference. The report was pub. in 1953. Amongst its recommendations were the following:

(1) The doctrine of constructive malice should be abolished. (At its broadest

Year	Murders known to the Police	No. of Crimes in which Supposed Murderer committed Suicide	Persons arrested for Murder	Persons found insane before Trial, on Arraignment, or 'Guilty but Insane'	Persons convicted of Murder (excluding those found 'Guilty but Insane')	No. of those shown in Preceding Column who were Executed
<i>Annual Av.</i>						
1920-9	148.6 (43.0)	35	79.5 (14.4)	24.1	23.9 (12.3)	13.9
<i>Annual Av.</i>						
1930-9	132.9 (24.5)	44.7	61.1 (8.1)	26.5	19.1	8.5
<i>Annual Av.</i>						
1940-9	166.6 (26.9)	42.8	81.5 (4.7)	32.5	26.9	12.7
1950	138 (16)	38	76 (6)	32	29	14
1951	124 (8)	40	65 (2)	31	24	19
1952	141 (9)	36	76 (4)	35	34	17
1953	141 (12)	41 (2)	67 (3)	20 (1)	26	16
1954	145 (9)	41 (4)	73 (1)	36 (1)	28	12
1955	133 (10)	32	70 (2)	40	24 (2)	9

this doctrine means that if one person kills another, even quite accidentally, while committing a felony or resisting arrest, he is guilty of murder. As applied in recent years by the courts, the doctrine may be said to be limited to cases in which death results from an act of violence. Nevertheless cases may arise where a person is convicted of murder who would only have been convicted of manslaughter were no felony involved.)

(ii) The minimum age below which a person cannot be sentenced to death should be raised from 18 to 21. (This recommendation was made by a majority of 6 to 5.)

(iii) The majority of members of the Royal Commission considered that it was advisable to abrogate the McNaughten rules, and to leave it to the jury to decide whether the accused was suffering from disease of the mind or mental deficiency to such a degree that he ought not to be held responsible for his act.

Failing this, they recommended that in addition to the 2 existing provisos under the McNaughten rules, namely, that the accused as a result of disease of the mind (a) did not know the nature and quality of his act; (b) did not know that it was wrong, a third proviso should be added; that he was incapable of preventing himself from committing it. They also recommended that the law should make no distinction between mental deficiency and insanity in tests to determine fitness to plead.

(iv) Without accepting the Scottish doctrine of 'diminished responsibility' as suitable for England, it was recommended that (a) the death sentence should not be carried out on any person certified as mentally defective; (b) in cases of epilepsy there should be a presumption that this may have been one of the causes that led to the crime; (c) the existence of a psycho-

pathic personality ought to be given due weight in determining whether the death sentence should be carried out.

(v) The Commission was concerned to find some way of 'enabling the courts, instead of the executive, to take account of extenuating circumstances so as to correct the rigidity of the existing law.' They recommended that the jury should be empowered to decide in each case whether a life sentence could properly be substituted for the death penalty. The trial would then be divided into 2 stages. In the first the jury would consider guilt or innocence. The second would arise only if guilt had been found. The jury would then consider any extenuating circumstances brought forward by the defence, and if they found that there were such circumstances, this finding would be binding on the judges, who would have to pronounce sentence of life imprisonment.

The pub. of the report gave a fresh impetus to the movement for abolition, and in 1956 a private member's bill was introduced by Mr S. Silverman, M.P., for total abolition, the gov. promising facilities if it was passed by the House. It did go through all stages in the House of Commons, but was thrown out by the House of Lords. The arguments against the bill that carried most weight were those concerned with the possible effect of abolition on the professional criminal. The fear was widely felt that in the event of abolition burglars and others would be more likely to carry arms and that the police would be faced with greater dangers, though the experience of abolitionist countries does not appear to give any support to this theory.

Following the House of Lords' rejection of the bill the gov. introduced its own Homicide Bill which received the royal assent on 21 Mar. 1957. Murder is now

punishable by death only if the offender has previously been convicted of a murder committed in Great Britain, or is found guilty of any of the following offences described in the Act as capital murder: (a) any murder done in the course or furtherance of theft; (b) any murder done by shooting or by causing an explosion; (c) any murder done in the course of or for the purpose of resisting or avoiding or preventing a lawful arrest, or of effecting or resisting an escape or rescue from legal custody; (d) any murder of a police officer acting in the execution of his duty or a person assisting a police officer so acting; (e) any murder by a prisoner of a prison officer in the execution of his duty or of anyone assisting a prison officer. Any murder not committed in any of the aforementioned circumstances is punishable by life imprisonment.

Experience of foreign countries. An important part of the reports both of the Select Committee of 1930 and the Royal Commission dealt with the experience of foreign countries which had already abolished C. P. On both occasions there was complete agreement amongst the foreign witnesses that the number of murders had not increased after abolition. The Royal Commission included a worldwide survey of available statistical evidence by the Amer. criminologist, Prof. Thorsten Sellin. His conclusion was that 'whether the death penalty is used or not, both death penalty states and abolition states show rates [of murder] which suggest that these rates are conditioned by other factors than the death penalty.'

This conclusion was accepted unanimously by the members of the Commission, who stated that 'there is no clear evidence in any of the figures we have examined that the abolition of C. P. has led to an increase in the homicide rate, or that its reintroduction has led to a fall.'

The following states have either abolished C. P. by law for the civil crime of murder or allowed it to fall into abeyance by a policy of reprieve:

Europe and Asia. Austria: Finally abolished, June 1950. Belgium: Abrogated by disuse; last execution, 1863, except for one case during 1914-18 war. Denmark: Abolished, 1930; no execution since 1892. Finland: Abolished, 1949; no execution since 1826, except during the revolution of 1918. W. Germany: Abolished, 1949. Netherlands: Abolished, 1870; no execution since 1860. Iceland: Abolished on estab. of rep., 1944. Israel: Abolished, 1954. Italy: Finally abolished, 1948. Luxembourg: Abrogated by disuse; no execution since 1822. Nepal, India: Suspended for 5 years in 1931; not reintroduced. Norway: Abolished, 1905; no execution since 1876. Portugal: Abolished, 1867. Rumania: Abolished, 1864; no execution since 1838; restored for political crimes, 1938. Sweden: Abolished, 1921; no execution since 1910. Switzerland: Abolished, 1942; no execution since 1924.

United States of America. C. P. is

abolished in 6 states of the Amer. Union, namely: Michigan, 1847; Wisconsin, 1853; Maine, 1887; Minnesota, 1911; Rhode Is., 1952; N. Dakota, 1895. In the 2 last states there is abolition except for murder in the first degree.

In 35 of the remaining 42 states there is power to pronounce an alternative sentence of life imprisonment. Nine states, having abolished C. P., restored it, 7 of them after a very short period.

Tennessee: Abolished, 1915; restored, 1919. Arizona: Abolished, 1917; restored, 1919. Missouri: Abolished, 1917; restored, 1919. Colorado: Abolished, 1897; restored, 1901. Iowa: Abolished, 1892; restored, 1898. Washington: Abolished, 1913; restored, 1919. Oregon: Abolished, 1914; restored, 1920. S. Dakota: Abolished, 1915; restored, 1939. Kansas: Abolished, 1907; restored, 1935.

South America. Argentina, 1922; Brazil, 1891; Colombia, 1910; Costa Rica, 1880; Dominica, 1924; Ecuador, 1897; Honduras (not included in constitution of 1894); Mexico, 1928; Panama, 1903; Peru (discontinued for about 50 years; reintroduced for political crimes, 1949); Uruguay, 1907; Venezuela, 1863.

Australia. Queensland, 1922; no execution since 1913.

See also MURDER.

Bibliography. C. R. Calvert, *Capital Punishment in the 20th Century*, 1927; Lord Templewood, *Shadow of the Gallows*, 1951; Royal Commission on Capital Punishment, *Report* (Cmd 8932), 1953; G. Gardiner, *Capital Punishment as a Deterrent*, 1950; Sir E. Gowers, *A Life for a Life*, 1956.

Capitalism, system underlying a society in which capital is privately owned and industry privately organised. But economic analysis shows that all forms of advanced industrial society depend on the employment of capital, whether privately owned, as in W. Europe, America, and the Brit. Commonwealth, or State-owned, as in the U.S.S.R. Where little capital is employed, as in the undeveloped Far E., society remains primitive and the standard of living low.

The accumulation of capital was fostered by means of commercial transactions, more especially when these were carried through on a large scale and involved the use of credit. On the termination of the crusades and the estab. of peace between E. and W. after sev. cents. of intermittent warfare, the E. began to pour her treasures into Europe. From their geographical situation the large cities in Italy were the first to profit from this new commerce, and a capitalist state of society began to show itself in the city states of Italy. This economic stimulus had its repercussions. At convenient points on the trade routes leading from Italy to the NW. of Europe, fairs were estab. These existed at first for the exchange of goods—barter pure and simple. But later the use of money became necessary, and with a wider variety of coins in use a new type of merchant came into being. This was the trader, who carried on the business of

money exchange; the foreign exchange of to-day had its beginnings in him. The *lettre de foire* (fair letter) was the forerunner of our modern bill of exchange. Another development was the system of transferring and cancelling these letters as they fell due at the fairs, which thus came to perform, in addition to their normal functions, the actions of the clearing-houses of to-day.

From commercial capital to financial capital was a short step. The troubled times of the Middle Ages often rendered it necessary for the heads of states to borrow money. These borrowings enriched all who took part in the money trade—tax-collectors, lenders, bankers, all helped in the accumulation of large stocks of capital. A development of the fair was seen in the estab. of exchanges, which assumed a growing importance in the 16th cent. In the fairs the business of buying, selling, and settlement could only be carried on intermittently (i.e. when the fairs were held at their different seasons), but the estab. of the exchanges rendered such operations a matter of daily routine. Although the Church had long forbidden the lending of money at interest, govts. were soon forced to recognise the desirability and necessity of this transaction. Lending money at interest is one of the props of modern C. The business of fairs and exchanges brought into use negotiable securities which contributed to the increase in speculation.

As the estab. of trade between E. and W. after the crusades regenerated the economic life of Europe, so the discovery of America gave additional impetus to this economic life, and in particular to the larger nations of W. Europe. Maritime and colonial commerce expanded, and Europe was enriched by the tropical products of the Far E. and the gold and silver from the mines of the New World. Another development which must be noticed at this time was the estab. of large colonial trading corporations such as the Eng. and Dutch E. India Companies. The rise of Holland as a great economic power in the 17th cent. was due to her success as a commercial and financial nation. Her maritime trade was considerable, and she conducted a lucrative business in negotiable securities. But by the beginning of the 18th cent. Holland's rapid expansion had ceased. She was primarily a commercial country, and industrialism had now set in, bringing England and France to the forefront by their ability to export not only natural products but also the products of their manufacturers. The rise of England and France marks another stage in C., which, in addition to its commercial and financial functions, now began to exert its influence on manufacturing industry. This at first had been in the hands of small men with little capital who were gradually ousted by larger merchants who sought to control the rural and domestic industries. They collected the products and found the customers. Industrial capital has been extended by the growth of large corporations, which

were at first formed to control industries where the initial outlay of capital was very high, but which now control many branches of modern manufacturing industry. The 3 forms of capital—commercial, financial, industrial—now operate concurrently. In modern times the influence of capital has made itself felt in practically every field of economic effort. At its commencement the colonial system assisted greatly in the development of capital, but this development was in turn responsible for the overthrow of the trade monopolies which had been estab. for the benefit of the mother country. The monopolies came to be regarded as obstacles to the natural expansion of commerce, and the rise of industrial capital contributed to the fall of the colonial system.

Karl Marx drew attention to the social effects of C. He demonstrated that it had created social classes characterised by economic rather than other distinctions, the effect of which had been to make society much more mobile and less hemmed in by the barriers of former times. But class-consciousness in the labouring classes, which resulted from economic changes, was not new. It was particularly noticeable in the Low Countries, where workmen became dependent on the merchants engaged in the export trade. Then, as now, commerce had its good and bad times, and it was the workmen who suffered most during the bad times. Risings, often accompanied by bloodshed, were frequent, and, by degrees, the craftsmen took their place in the gov. of the Flem. tns, which seemed to be moved by a guild rather than a class spirit. At the beginning of the Industrial Revolution (q.v.) in England it was the workmen who opposed the innovation. They were the conservatives who demanded the maintenance of the old order of things. But in the end the policy of *laissez-faire* as opposed to intervention prevailed, and the new industrialists developed their manufacturing businesses with little or no interference from the State.

The relationship between capital accumulation and the distribution of income was clearly described by J. M. Keynes in his *The Economic Consequences of the Peace*, 1920. He states that 'Europe was so organised socially and economically as to secure the maximum accumulation of capital. While there was some continuous improvement in the daily conditions of life of the mass of the pop., society was so framed as to throw a great part of the increased income into the control of the class least likely to consume it. The new rich of the 19th cent. were not brought up to large expenditures, and preferred the power which investment gave them to the pleasures of immediate consumption. In fact it was precisely the *inequality* of the distribution of wealth which made possible those vast accumulations of fixed wealth and capital improvements which distinguished that age from all others. Herein lay, in fact, the main

justification of the capitalist system. If the rich had spent their new wealth on their own enjoyments, the world would long ago have found such a regime intolerable. But like bees they saved and accumulated, not less to the advantage of the whole community because they themselves held narrower ends in prospect. The immense accumulations of fixed capital which to the great benefit of mankind were built up during the half-century before 1914 could never have come about in a society where wealth was divided equitably. The railways of the world, which that age built as a monument to posterity, were, not less than the pyramids of Egypt, the work of labour which was not free to consume in immediate enjoyment the full equivalent of its efforts.

The capital system has been more widely, more bitterly criticised than any other human institution. Its detractors point to its blemishes, but rarely indicate the blessings which it has conferred. These are too often taken for granted. It is 40 years since the beginning of the greatest experiment ever undertaken by man in an endeavour to ameliorate the lot of his fellows by the overthrow of the private capital system and the imposition of a state C. called Socialism. And there are 2 opinions about its achievements. Nowhere in the present state of society is there any sign of evolution on lines of Marxian prophecy: that the smaller capitalist would be engulfed by the few largest, and that this process of centralising the means of production must at length reach the point of incompatibility with the capitalist system. If the Marxian theory of concentration has now been very generally abandoned, it is because theoretical investigation has invalidated every step in its hypothetical development. Facts continue to multiply the evidence in favour of the capitalist system: contrary to Marx, the system does not necessarily involve economic crises; or depress the condition of the working class; nor does it, through the introduction of ever-improving technical machinery, reduce the chances of employment—all of which consequences are repeatedly asserted in Marxian theories and by the followers of Marx. Moreover the experiment in Soviet Russia has supplied the most powerful arguments to those writers who defend the capitalist system. Russia, hit by the First World War far less than most of the other belligerents, only very slowly showed a power of recuperation in any way comparable to the rest of Europe, in spite of her unlimited potentialities. So impracticable did Lenin find his anti-capitalist organisation that he had perforce to introduce his 'new economic policy,' which allowed a restricted degree of free exchange in the capitalistic sense. Lenin's attempt to save the situation by the introduction of free price fixing for marketed products was foredoomed, for the reason that it could have been effective only in regard to capital. It had no relation to a system which,

temporarily at all events, abandoned private property in capital. There came to be a private money market in Russia on a limited scale, and, as may be supposed from Russia's difficulty in obtaining credit from other nations, this market showed phenomenal private discount rates. A significant development of capital in the 20th cent. was the growth of cartels (q.v.). It has been argued that the formation of cartels is the necessary consequence of ruinous competition, and that one important factor in this competition as it affects cartels is the growth of fixed costs, i.e. the costs which form a permanent part of every concern irrespective of demand. But so long as there is no external authority to inhibit competition, the cartel is liable to be weakened by changes in the demand for its products and by the supply of new substitutes. Moreover much monopoly is itself the creation of the State, and can be avoided or minimised by anti-monopoly legislation. See MONOPOLY. See also H. Withers, *The Case for Capitalism*, 1920; Sir E. J. Bann, *Confessions of a Capitalist*, 1925; H. See, *Modern Capitalism* (trans. by H. B. Vanderblue and G. F. Doriot), 1928; A. Weber, *In Defence of Capitalism*, 1929 (trans. by H. J. Stenning, 1930); R. G. Hawtrey, *Capital and Labour*, 1937; M. Dobb, *Political Economy and Capitalism*, 1937, *Studies in the Development of Capitalism*, 1948, and *Soviet Economic Development since 1917*, 1948; Joseph Schumpeter, *Capitalism, Socialism, and Democracy*, 1942; M. Dobb, *Development of Capitalism*, 1949; T. Wilson, *Modern Capitalism and Economic Progress*, 1950.

Capitanata, see FOGGIA.

Capitation Tax, see POLL TAX.

Capito, Gaius Ateius, Rom. jurist of the time of Augustus. He became *consul suffectus* in AD 5, *curator aquarum publicarum* in 13, and *d.* in 22. He studied law under Offilius, and was a rival of Labeo (q.v.). O. founded the Sabinian school of jurisprudence in opposition to the Proculian of Labeo. Only fragments of his works remain.

Capitol (Lat. *Capitolium*), name given to the temple of Jupiter Capitolinus and other buildings on the Capitoline Hill (*mons capitolinus*) in ant. Rome. The temple is said to have been founded by Tarquinius Priscus (see TARQUINIUS), and dedicated in 509 BC. It was damaged by fire in 83 BC, rebuilt, but destroyed again by fire in AD 69 and AD 80. It was again restored by Domitian. It formed the central point of the religious life of Rome. To it generals went to make thank-offerings to the gods for triumphant campaigns, and consuls to record their vows, while the senate often met on the hill. The temple was surrounded by minor buildings, and by an esplanade on which were statues of gods and heroes. The steepness of the hill rendered it an admirable natural fortress. Near the temple was the Tarpeian rock from which traitors were thrown. On the NE. peak—the Arx—stood the temple of Juno Moneta. In the Middle Ages all the buildings had fallen into ruins, and in 1534 Michelangelo

was commissioned by Pope Paul III to draw up plans for new buildings on the site. The C. now consists of a square, containing a statue of the Emperor Marcus Aurelius, the Campidoglio, built by Michelangelo, the Senatorial Palace (1579), the Capitoline Museum (1644), and the church of S. Maria in Ara Coeli. See T. Ashby and S. Platner, *Topographical Dictionary of Ancient Rome*, 1929.

Capitularium (Capitularies) (Lat. *capitulum*, chapter, from *caput*, head), name applied to the constitution or laws promulgated by the Frankish kings. These laws were classed under different chapters, called capitularies. The first collection of these was pub. in the reign of Louis the Pious.

Capitulation, in time of war, an agreement for the surrender to a hostile armed force of a fortress, tn, piece of ter., or body of troops, naval or military, with the detailed conditions under which the surrender is to be made. The term used to be restricted rather to the surrender of a beleaguered garrison. The agreement by which an army or a large div. of troops surrendered to a superior force, or engaged to evacuate the ter. which it occupied, when its strength and condition were yet such as to make itself respected by the enemy constituted a set of circumstances known as a convention. Such was the convention of Cintra, made at Lisbon between Gen. Dalrymple and the Fr. general, on the departure of the Fr. army from Portugal in 1808. When the provisions and ammunition of a garrison or force are nearly expended, and no chance remains of the siege being raised or the force succoured, the governor of the besieged town, or commander of the defeated force, is justified in entering into an agreement with the enemy respecting the terms on which he consents to surrender; and by the rules of war he is entitled to obtain an honourable C. It is to be observed, however, that if he should postpone surrender proposals till his provisions are entirely exhausted, the enemy may refuse to grant terms, and he can then only surrender at discretion. The conditions of C. vary greatly, and are necessarily determined by the circumstances of the case and the degree of generosity or patience of the victors. From the nature of the circumstances of most C.s., no previous instructions are or can be required from the capitulating party's gov. before the final determination of the conditions of C. The conditions generally include the surrender of the arms and military stores of the garrison or other capitulating body to the victors; the officers and troops retain only their private property, but are, or were, allowed to march out of the fortress or tn, or to their place of destination, with the honours of war, that is, with drums beating and colours flying. Other very usual conditions are, or were, freedom of religion and security of private property. It must be admitted, however, that the rules of warfare on which an ordered C. depends do not always find a place in modern warfare as exemplified

in the Second World War. Where a C. is made by an officer who is not invested with the proper authority, or who has exceeded the limits of his authority, the C. is called a sponson. Article 35 of The Hague Convention of 1899 requires a sponson to be confirmed by the express or implied ratification of the state or commander-in-chief on the side of the officer accepting the surrender, coupled with the agreement of the other side to accept the ratification, in order to be binding. It is an implied term in the C. of a place that the capitulating force shall not destroy its fortifications, stores, or ammunition after the agreement has been concluded. *Authorities*: T. E. Holland, *The Laws of War on Land*, 1908; W. E. Hall, *Treatise of International Law* (ed. Higgins), 1924; W. Wheaton, *Elements of International Law* (ed. Wilson), 1936.

Capitulations denote the arrangements and confirmatory treaty by which foreigners are granted immunity from the civil or criminal jurisdiction of the state making such C. Such arrangements and treaties necessarily constitute a derogation from the inherent sovereign rights of an independent state, and are only resorted to as against states which can hardly be said to be sufficiently advanced in their civilisation to observe the general rules of international law. An instance of such C. is furnished by the arrangements made at various times since 1535 between the various powers and the former Turkish Porte. Even before the First World War signs were not wanting that the era of C. was ending. Certain countries, such as Morocco and Tripolitania, had passed under the control and jurisdiction of great powers like France and Italy, whose laws were deemed adequate to the needs of all European nationals. Then other countries, of which Japan is an outstanding example, reached the full status of a great power, which would allow no derogation of their sovereignty. The First World War intensified national feeling, and few nations to-day would, without strong protest, grant capitulatory rights to foreigners. In large part, too, the willingness of a nation of 'backward people' to grant capitulatory privileges depended on the prestige attaching to a united Europe. When this unity was shattered by the First World War the 'backward' countries were encouraged to resist these encroachments on their sovereignty. Also the series of peace treaties at the end of the war deprived the nationals of the Central Powers of these rights, and the Soviet Union in some cases voluntarily gave up these privileges. By the terms of the treaty of Lausanne, 1923, Great Britain gave up her C. in Turkey, and she abandoned them in Albania in 1926, and in Persia in 1928. C. in some form or other for certain European powers continued, however, to exist in China, Egypt, and Morocco until the Montreux Convention of 1937. By the terms of this convention, which came into effect the following year, C. were virtually abolished, except for a few small nations such as

number of negotiations with the British in S. Africa; these were on the whole advantageous to his country, though the colonial party attacked him for relinquishing claims to Zanzibar in exchange for Heligoland. C. passed the Army Bill in 1893 and was dismissed in 1894, militarists, land-owners, and colonialists all being violently critical of various aspects of his policy.

Caproic Acid, or **Hexoic Acid** ($C_6H_{12}O_2$), acid found in butter and coco-nut oil. It is obtained from the latter by saponification with caustic potash and distillation with dilute sulphuric acid. It is a fermentation product of butyric acid, and an oily liquid of unpleasant odour.

Capros, genus of boar-fishes, occurs in the Atlantic and Mediterranean in rather deep water. *C. aper* is not unlike the John Dory, but the dorsal spines lack long filaments. This species is about 6 in. long, a pale carmine colour above and silvery-white beneath.

Caprella, genus of Crustiferae, known in Britain chiefly from *C. bursa-pastoris*, the shepherd's purse (q.v.).

Capsicum, genus of Solanaceae, which is of economic importance on account of the pepper obtained from some of the species. The shell of the fruit is fleshy, coloured, and contains a pungent principle which also exists in its seed. Both the fruit and the seed of different species are therefore valuable as a condiment, and are used in seasoning food and in the preparation of pickles. *C. annuum*, a weedy plant found wild in S. America and the W. Indies, is greatly cultivated, and its fruit and that of *C. longum* are known to us as chilli or red peppers; dried and ground they form cayenne pepper. *C. fruticosum* is an E. Indian shrub with a small fruit, which is called goat-pepper.

Capstan (Fr. *cabestan*; Lat. *capistrum*, a halter; Sp. *cabestrante*), machine used on a ship for manipulating weights, such as anchors. Cs were originally made of wood, but are now generally made of iron. The axis of this appliance is vertical, differing in this respect from a windlass, which has a horizontal one. The barrel, round which the rope is coiled, is larger at the top and bottom than in the centre, thus allowing the cable to be drawn towards the centre. It is also ridged so that a larger amount of rope may be wound at one time. The drumhead, which is fixed above the barrel, has a number of square holes in it, and the C. bars project from these holes like the spokes of a wheel. At the base of the C. are placed the pawls, or short bars of iron, bolted to the deck by means of the pawl rim. These are to prevent any recoil of the rope. The usual method of working Cs at the present time is by machinery rather than by hand. Cs are also used in railway goods yards for shunting trucks.

Capsule, name applied in botany both to dry dehiscent (splitting) fruits formed from more than one carpel and to part of the sporogonium of the Bryophyta, or liverworts and mosses. In the latter case the C., or theca, gives rise to spores, and

thus is of importance in the asexual generation of the plants. The capsular fruits are developed from ovaries of which the carpels are fused, and there may be 1 loculus (chamber) or more than one; the dehiscence, or splitting open, is performed in various ways, and ought to be noted. If the splits run down the midrib of the carpels, e.g. iris, it is called *loculicidal*; if the fruit splits into its various carpels, e.g. rhododendron, *septicidal*; if the outer wall breaks and the seeds remain in the middle, e.g. thorn-apple, *septifragal*. In the poppy the dehiscence is *porous*, the seeds falling from holes at the top of the fruit, and in the pink the fruit dehisces by means of teeth. The Cs of the scarlet pimpernel and the plantain split open by means of a lid; they are examples of *pycidia*.

Captain, title found in almost all languages to denote a chief of a small band of men (from Lat. *caput*, head, chief). This name is especially applied to a grade of officer in the army or navy.

Navy. Strictly the commanding officer of a man-of-war or of a frigate carrying at least 20 cannon. In the Brit. Navy and most others the C. is next in rank to the rear-admiral or commodore (almost corresponding to an army colonel). This rank was first clearly defined in the Brit. Navy in 1747, originating probably from the time when navigating and fighting forces on war vessels were combined. In earlier times the 'master' had charge of the navigation and the fighting was done by soldiers under their military officer. A C. in the R.N. is responsible for military gov., navigation, and equipment of his ship, for the crew's discipline and health, and for neglect of duty in inferior officers. *Post-C.* merely means full C. (from the time when Cs of large vessels were 'posted' on the permanent list of Cs, from among whom admirals were chosen). A *flag-C.* commands the admiral's ship. The *C. of the fleet* is a temporary official appointed by the Admiralty to keep up the discipline of the fleet. He acts under a commander-in-chief as adjutant-general of the force, and wears the uniform of rear-admiral. The title is applied by courtesy to all who command ships at sea, whether they hold that rank or not. It is also given to the chief sailor of particular gangs of men in charge of a certain portion of the ship's company, as C. of the 'top,' 'forecastle,' 'hold,' 'gun,' etc.

Military. In the Brit. Army the commanding officer of a company, troop, or battery, ranking between a major and a lieutenant. This grade is the third in the order of promotion. Formerly the title of an officer of high rank (like the modern colonel), it is nowadays restricted to the head of a company or squadron. He is responsible for the arms, clothes, discipline, welfare, and efficiency of his unit. The C. also keeps all accounts and reports of the company. He selects the first sergeant, and recommends non-commissioned officers. The title *C.-general* meant chief commander of the army or militia, and is still so used in

Spain; also for the governor of Sp. provs. or colonies.

'Captain,' ship name in the Brit. Navy closely bound up with Nelson's battles. But the best-known *C.* is that of the disaster of 7 Sept. 1870. This vessel was a turret ironclad of 6950 tons built in 1869; it capsized in a violent storm off Finisterre and was lost. The first ship of this name was built in 1878, and the following are important battles in which a *C.* figured: Beachy Head, 1690; Barfleur, 1692; the battle off Cape Passaro, 1718; Minorca, 1756; Louisbourg, 1758; the Quebec expedition, 1759; Toulon, 1793; Hotham's battle off Genoa, 1795; Hyères, 1795; at Corsica, 1795; Cape St Vincent, 1797; Copenhagen, 1807; and Martinique, 1809.

Capua, It. fort. tn, in Campania (q.v.), on the Volturno (q.v.), 7 m. WNW. of Caserta. The site of the anct city of this name is 3½ m. SE., and is to-day called Santa Maria di Capua Vetere. The anct city was founded by the Etruscans (see ETRURIA), but in the 5th cent. BC was captured by the Samnites (see SAMNIUM), and eventually became subject to Rome. It was then a city of great wealth and influence. After the battle of Cannae (q.v.) it went over to Hannibal (q.v.), whose army wintered here in 216 BC; 4 years later it was recovered by the Romans. In the 5th cent. AD it was razed by Genseric (q.v.), but evidently soon rebuilt, and in 840 it was again destroyed by the Saracens (q.v.). The modern *C.* was begun c. 856 on the site of the old tn of Casilinum. It was besieged by Cesare Borgia (q.v.) in 1501, an event commemorated by a tower. Later it was fortified by Vauban (q.v.), and the fortifications were extended in 1855. The tn was very severely damaged during the Second World War; the archiepiscopal cathedral was almost completely destroyed. Since the end of the war there has been much reconstruction. Agric. machinery is manuf., and there is a large trade in agric. produce. Pop. 15,400.

Capuana, Luigi (1839-1915), It. novelist, playwright, and critic, b. Mineo, Catania. As dramatic critic to the *Nazione* of Florence and other periodicals he wrote the articles which form the vols. called *Studi di letteratura contemporanea, Libri e Teatro*, etc. But *C.* was at his best as a story-teller and novelist, and particularly when dealing with the world of his infancy and youth. He advocated a realistic and impersonal art, and his works are of an almost scientific objectivity. Many of his novels and tales are known in trans. in England, France, Germany, and Russia. Among his best works are *Profil di donne*, 1877, *Giacinta*, 1879, *Il Profumo*, 1890, *Paesane*, 1894, *Il Marchese di Roccaverdina*, 1901.

Capuchin Monkey, name given to either the whole genus *Cebus*, or sapajous, or else specifically to the individual *C. capucinus*, the weeper. A native of Guinea, it is distinguished by having the hair on the crown and back part of the head black, resembling a monk's hood or cowl, the remainder of the body being greyish.

The genus consists of monkeys which have a completely hairy tail and a well-developed thumb, and the species are not woolly. They are found wild in S. America and are frequently kept in captivity, especially by organ-grinders. Their diet is chiefly vegetable, but they do not refuse insects and caterpillars.

Capuchins, order of friars in the Rom. Catholic Church, originally a branch of the Franciscans. It was founded by Matteo di Bassi in 1528, who, returning to what he believed to be the true habit of St Francis, grew a beard, went barefoot, and wore a pointed hood (*capuche*) from which the order takes its name. In 1619 the *C.* became an independent order. They are numerous, wear a brown habit, and are occupied mainly in missionary labours. See FRANCISCANS.

Capulets and Montagues, Eng. names of 2 legendary noble Veronese families, the Cappelletti and the Montecchi, famous for their rivalry, their hereditary hatred, and bitter feuds. Their story is bound up with the It. traditions of the Middle Ages; both families belonged to the Ghibelline party, and they are referred to by Dante (*Purgatorio*, canto vi). Shakespeare immortalised them in *Romeo and Juliet*.

Capus, Vincent Marie Alfred (1858-1922), Fr. dramatist and novel-writer, b. Aix-en-Provence. He received the education of an engineer, but never followed the profession. His first novel, *Qui perd gagne*, appeared in 1890; it was followed by *Faux Départ*, 1891, and *Années d'aventures*, 1895. His best-known plays are *Brignol et sa fille*, 1895, *Rosine*, 1897, *La Veine*, 1901, *Les Deux Écoles*, 1902, *Le Beau Jeune Homme*, 1903, *Un Ange*, 1909, and *L'Aventurier*, 1910. *C.*'s works are pervaded by an optimistic fatalism; they are highly amusing and, in general, reflect the life of Paris of his time.

Capybara, or **Carpincho** (*Hydrochoerus hydrochoerus*), species of rodent of the Cavidae, or cavy family; also known as water-hog. It is the largest rodent in existence, being sometimes 4 to 5 ft in length; the ears are small, there is no tail, the hair is rough. The anterior limbs are 4-toed, while the posterior are 3-toed, and all the digits are webbed, with hoof-like nails. It is an aquatic animal and does not move swiftly on land, but is a good swimmer and diver. See CAVY.

Caraballos Occidentales, range of mts in the is. of Luzon in the Philippines. They extend in a northerly direction from the Gulf of Lingayen to Mayraira Point. The highest point is 5517 ft. The range is complex in character, with a central ridge of spurs.

Carabidae, or ground-beetles, form a family of coleopterous insects, many of which are large and adorned with brilliant metallic colours. They are terrestrial, and few of the Brit. species are capable of flight. About 13,000 distinct members of the family are known to exist. The larvae destroy many smaller insects and worms.

Carabine, see CARBINE.

Carabineers, or **Carbiniere**s (from Fr. *carabinier*), literally means soldiers armed

with carbineers, but was actually applied to cavalry who used the carbine, a shorter and less cumbersome form of the musket. Their function was to act as skirmishers and harass the enemy. The name was abolished in the Fr. Army in 1870. The 6th Dragoon Guards, now represented by the 3rd Carabineers (the Prince of Wales Dragoon Guards), in the Brit. Army obtained the appellation of the C. See DRAGOON GUARDS.

Carabobo, state of Venezuela, bounded on the N. by the Caribbean Sea. Valencia (cap.) and its port, Puerto Cabello, are the prin. tns. It is a notable agric. area; the chief products are cotton and sugar cane, and others include tobacco, rice, cacao, and corn. At the small tn of C., some 15 m. SW. of Valencia, is the fine memorial of the battle which ended Sp. rule in NW. S. America (1821). Area 1795 sq. m.; pop. 243,160.

Carabus, typical genus of the family Carabidae (q.v.), represented in Britain, for example, by *C. violaceus*, a metallic-coloured beetle. Some species are vegetable feeders, but others eat carrion, and some will attack living snails.

Caracal, tn of Rumania, in the prov. of Craiova, 95 m. WSW. of Bucharest. Its name is derived from the Emperor Caracalla, who in 217 built a tower there, the ruins of which still remain. Pop. (1930) 15,000.

Caracal, species of lynx found in Africa and SW. Asia. It is a reddish-brown, with white under-parts and 2 white spots near each eye. The ears terminate in a long tuft of black hair. It is savage and powerful. The skin is made into coats by the Kaffirs.

Caracalla, Marcus Aurelius Antoninus Bassianus (186-217), Rom. emperor, eldest son of Septimius Severus; the nickname C. was due to his wearing the long Gallic tunic. He accompanied his father to Britain (208-11), and in 211 became joint emperor with his brother Geta, whom he murdered, thus becoming sole emperor (212). Among the 20,000 supporters of Geta who also perished was Papinian, the jurist. C.'s reign was a series of cruelties and extortions. His 'Constitutio Antoniana' extended full citizenship to all free inhab. of the empire, merely so that he might get money from the provs. C. was murdered on a plundering expedition against the Parthians, at the instigation of Macrinus, who succeeded him. He built at Rome the *Thermae Caracallae* or *Antoninianae*, and the triumphal arch of Septimius Severus. See Gibbon's *Decline and Fall* (Chap. VI) and Meistor's *Dissertatio de Caracalla*, 1792.

Caracara, or **Carancho** (*Polyborus tharus*), carrion-hawk of the family Falconidae, and common to America. The bird is a powerful flyer and a good walker. Its nest is sometimes built in trees and sometimes on the ground, and the eggs are 3 or 4 in number. It feeds on carrion and also on young animals which it captures alive.

Caracas, city and cap. of Venezuela. It lies in a vale of the Andes 7 m. N. of its port, La Guaira. The soil is fertile,

the water supply good, and the climate healthy, owing to its being about 3000 ft above sea level. Since the recent oil boom it has been almost entirely rebuilt on the best modern lines. Among its notable buildings are the cathedral, univ., gov. buildings, museum, and library. C. has been sev. times shaken by earthquakes, and in that of 1812 was almost destroyed. It is a large manufacturing city and an important commercial and cultural centre. Bolivar is buried in the Partheon. Pop. 500,000; with suburbs, 700,000.

Caracci, or **Carracci**, name of 3 It. painters who founded the 'eclectic' school of painting in Bologna in the 16th cent. A sonnet written by Agostino makes clear their ambition; they were to combine Michelangelo's power, Titian's 'truth and nature,' Correggio's 'purity of style,' and Raphael's symmetry. The criticism of this learned approach is that it did not make for originality and was even somewhat neutral in result.

Lodovico Caracci (1555-1619) was the founder of the school, but finding that he could not carry out his plan without help, he persuaded his 2 cousins, Agostino (1557-1602) and Annibale (1560-1609), to join him. The three opened an academy in Bologna, which they maintained together for 3 years. Agostino, who had prepared himself by study under Fontana and then in Parma and Rome, was esteemed as an engraver as well as a painter. Annibale left Bologna at the invitation of Cardinal Odoardo Farnese, who commissioned him to decorate his palace in Rome. Here Agostino joined him and assisted in the work till the 2 brothers quarrelled and finally separated. 'Susannah and the Two Elders,' in the National Gallery, is a fine example of Lodovico's work, Agostino's masterpiece is his 'Communion of St Jerome' (Bologna), while Annibale's work is well represented by 'Silenus gathering Grapes' (National Gallery).

Caraccioli, name of an anct noble Neapolitan family, the most distinguished members of which were Marino, Gianni, Domenico, and Francesco:

Marino Caraccioli (1469-1538), cardinal and statesman, created Duke of Milan by Charles V.

Gianni Caraccioli (c. 1480-1550), Prince of Melfi and grand seneschal of the kingdom of Naples. He was on the Fr. side (except for a short interval) after the conquest of Naples by Charles VIII. For his defence of Luxembourg in 1543, Francis I made him a marshal.

Domenico Caraccioli (1715-89), statesman and economist; ambas. successively at Turin, Paris, and London. He d. as viceroy of Sicily.

Francesco Caraccioli (1748-99), admiral. He served in the Brit. Navy, then had command of a Neapolitan squadron. In 1798, when Naples fell into the hands of the French, he entered the service of its new gov. After the battle of the Nile the court of Naples was drawn into the war against France and the king and queen of Naples took refuge in Palermo under the

protection of Nelson. When Suvarov drove the French out of Italy again, the king and queen re-entered Naples on the faith of a treaty which amnestied their 'revolted' subjects, among whom was C. Nelson declared the capitulation of Naples null and allowed the vindictive creatures of the court to wreak vengeance on disarmed enemies and gave his sanction to the execution of C., who had served in the rebel cause only under compulsion, and C. was hanged on Nelson's ship (1799).

Caractacus, or **Caratacus**, Brit. king, son of Cunobelin (q.v.), King of the Trinovantes of SE. Britain. He led the resistance to the Romans, AD 48-51. He was decisively defeated by Ostorius, 51, and sought refuge with Cartimandua, Queen of the Brigantes. She, however, handed him over to the Romans. C. was sent to Rome, where he probably d., the Emperor Claudius rewarding his courage by granting him an honourable captivity.

Caradocian Series, a term describing a group of Ordovician rocks in the upper part of that system. The name is derived from Caer Caradoc in Shropshire. The Caradoc Group and the succeeding Ashgill Group can be taken as equivalent to the Bala Series which includes the uppermost Ordovician rocks in Wales.

Caradori-Allan, Maria (1800-65), Albanian singer, b. Milan. After singing in France and Germany, she came to London in 1822. She was popular as a concert singer; she went to Venice and sang there for a season, returning to England, where she settled in 1830. She sang the soprano part in the first performance of Mendelssohn's *Elijah* at Birmingham in 1846.

Caraffa, name of a famous Neapolitan family of whom the following members are the best known:

Giovanni Pietro (1476-1559), became Pope Paul IV (q.v.).

Carlo (1519-61), nephew of Giovanni Pietro. After serving under the Spaniards in the Netherlands, he was made a cardinal by his uncle, who was then Pope.

Antonio (1539-91), cousin of Carlo, was made a cardinal by Sixtus V. He arranged for a revision of the Bible, an exposition of the canons of the Council of Trent, an ed. of the *Septuagint*, etc.

Antonio (d. 1693), later member of the family, distinguished himself in the service of Austria, and became a field marshal. He was made Governor of Hungary in 1685, but his cruelty in the affair of the Tekeli conspiracy led to his recall in 1687. In 1688 he conquered Transylvania from the Turks.

Caragiale, Iohn Luca (1852-1912), Rumanian author and playwright. His works are popular in Rumania, and include comedies and novels. His comedies are satirical; the best known of them are *Noctea furtunoasă* (A Stormy Night) and *Scrisoarea pierdută* (The Lost Letter). In his greatest piece, *Năpasta* (Contempt), he attained genuine tragic horror. Later in his life he wrote a number of short stories admirable for their psychological observation. An Eng. trans. of 4 plays was pub. in 1956.

Caraglio, Giovanni Jacopo (c. 1500-51), It. engraver, b. either Verona or Parma. His engravings—a large number of which are after Raphael—place him high in his profession. He also devoted a great deal of his time to the cutting of precious stones.

Carales, see CAGLIARI.

Carambola, or **Caramba**, see AVERHOA.

Caramel, substance produced by the application of heat to loaf sugar. When sugar is gradually heated it loses water and other substances. At the temp. of 220° C., the liquid which has been formed becomes frothy; it is maintained for some little time at this temp., and then poured out to cool. The solid thus produced is a dark-coloured brittle mass, with a characteristic smell and a persistent bitter taste. It is used for artificially colouring many things, such as beer, vinegar, gravy. The name is also given to a popular kind of sweetmeat.

Caran, see COURLAN.

Caran d'Ache, see POIRÉ, EMMANUEL.

Caranoo, see CARACARA.

Carapa, genus of trees, family Meliaceae. The species are tropical and *C. moluccensis* inhabits muddy swamps. *C. procer* and *C. guianensis* both yield oil from the seeds.

Carapace, protective covering of many animals, particularly the arched bony plate which is characteristic of the Chelonia (e.g. tortoise), and to the shield which protects the fore parts of the Crustacea (e.g. crab).

Carapegua, tn. of Paraguari dept. Paraguay, 45 m. SE. of Asunción. The surrounding country is fertile, oranges, cotton, tobacco, sugar-cane, etc., being grown. Pop. 21,300.

Carat, see GOLD and METROLOGY.

Caractacus, see CARACTACUS.

Caracsius, Marcus Aurelius, Rom. soldier, b. Gaul during the 3rd cent. AD. He was given a command in the Rom. army, but was suspected of trying to enrich himself by encouraging piracy. Being sentenced to death, he retired to Britain, usurping the title of emperor (286) and the Emperor Maximian was eventually compelled to recognise his rule there. He was assassinated in 293.

Caravaca, Sp. tn in the prov. of Murcia, on the C. It has 2 fine Baroque churches, is known for its wine, and manufs. *espadrilles* and paper. Marble is quarried near by. Pop. 21,000.

Caravaggio, Michelangelo Amerighi, or **Merisi, da** (1573-1610), It. painter, b. Caravaggio; originally a mason; turned to painting and became famous and controversial in Rome for his 'Naturalism' or revolt against the insipid conventions then prevailing. He introduced plebeian types into religious subjects; and painted from nature and by artificial light, with dramatically violent effects of light and shade. His wild life, in the course of which he visited Naples, Malta, and Sicily, brought him to an unfortunate end; but his art had a European influence, from Holland to Spain. 'The Entombment' (Vatican) and his portrait of Olaf de Wignacourt, grand-master of the

Knights of Malta (Louvre), are among many impressive works. See R. Hinks, *Caravaggio*, 1953; B. Berenson, *Caravaggio*, 1953.

Caravaggio, Polidoro Caldara da (c. 1495-1543), It. painter, b. Caravaggio. He was first employed to carry mortar for the artists, but Raphael noticed his ability, and he was taught to paint. After the sack of Rome he fled to Naples and then to Messina, where he amassed a large fortune. He was robbed and murdered at Messina. One of his best-known pictures is 'Christ bearing the Cross' (Naples).

Caravaggio, It. tn. in Lombardy (q.v.), 14 m. S. of Bergamo (q.v.). It has a famous pilgrimage shrine, and was the bp.

industry in the world, exporting considerably to the Continent. America produces the greatest number of C.s (roughly 100,000 a year compared with Britain's 24,000). In America C.s are called trailers and over 90 per cent are residential. They are very much larger than those in Britain, averaging 40 ft in length, and are entirely self-contained. On the Continent C.s are becoming increasingly popular: in France over half the C.s are British. They are not, however, used very much for residential purposes yet, being used mostly for touring.

The Caravan Club of Great Britain was first formed in 1907, and was reorganised in 1935 exclusively for motor trailers.



E.N.A.

A CARAVAN IN THE GOBI DESERT

of Michelangelo C. and Polidoro C. (qq.v.). Pop. 10,000.

Caravan: 1. Literally a house on wheels. C.s are usually of the trailer type in Great Britain, except for those of travelling showmen which have motorised chassis, and also those used for motorised banks, laundries, libraries, dark rooms, etc. The C. is often made from aluminium in England and America, but there is an increasing tendency to use moulded plastics (polyester resins reinforced with glass fibre): these plastics are much more elastic, and allow for rougher treatment than aluminium. They are also easier to work, and have a better finish. The maximum size for a C. in Britain is 22 ft long by 7 ft 6 in. wide, and the average length for a touring C. is 15 ft. The C. is amazingly compact and well designed to conform to the road regulations and also to ensure that it is properly balanced as a trailer. For those who cannot afford a house it is ideal. Nowadays some sites have all the amenities of a village, with shops, laundries, educational facilities, and children's playgrounds.

Britain has the second largest C.

It is a national organisation giving advice on all aspects of caravanning, being run on parallel lines to the Automobile Association and the Royal Automobile Club. It is also a social club, and has affiliated clubs in New Zealand and S. Africa.

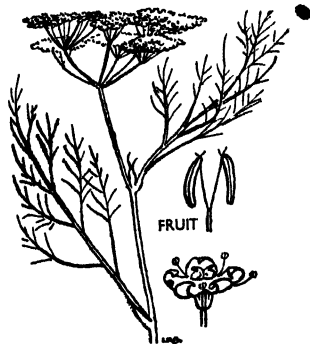
2. (Persian *karwan*, from *kāra*, people, army) Name in N. Africa and the E. for large companies of merchants, pilgrims, or others travelling together for security, especially across the deserts. From the very earliest times C.s have been the chief means for transfer of merchandise in Asia. There are frequent references to them in the Bible (Gen., Job, Isaiah, Psalms). Camels are largely used for transport of heavy goods, especially in arid, sandy regions, as their powers of endurance are so great. Heavy C.s are those in which the camels have a load of 500 or 600 lb., going about 18 to 20 m. a day; in light C.s they only have half that weight, and go about 22 to 25 m. a day. The ordinary seasons for trade C.s are spring, early summer, and later autumn, Friday being the favourite day for the start. The leader of the trade C. is called *Karwan-Bashi*, or *Ra'is* (chief), and is chosen by

the merchants before starting. He acts as general manager, spokesman, and arbitrator; but in the matter of trafficking each member of the C. acts independently. The word does not occur in English before the early years of the 17th cent.; another form is *carouan*. The trade between Tripoli and the interior of Africa, between Darfur and Egypt, between Russia and China, used to be mainly carried on by C.s. The old Arab trade routes led to Egypt, Syria, and Mesopotamia; and between the 8th and 11th cents. AD Arab traders appear to have gone regularly as far as the Baltic. Many old Arabic coins have been discovered in NW. Europe.

Caravansary, or **Caravansera**, kind of unfurnished inn where the caravans (q.v.) are put up in E. countries.

Caravel, sailing boat of Portuguese origin, having 3 or 4 masts; much used by navigators of the 15th and 16th cents. The oldest forms were entirely lateen rigged, the foressail being the largest; subsequent types had square sails fitted to the foremast. Another characteristic feature was the square stern. See **CARVEL**.

Caravelas, seaport of Bala, Brazil. It is a centre of the whale fishery of the Abrolhos Is. Pop. 2150.



CARAWAY

Caraway (*Carum carvi*), biennial herb of the Umbelliferae, grown for its furrowed, halved fruits, known as C. seeds, which are used for flavouring in confectionery, in perfumery, as a carminative in medicine, and in distilling a liqueur; while the roots are sometimes eaten in N. Europe.

Carayon, Auguste (1813-74), Fr. author, b. Saumur. He joined the Society of Jesus, and from that time almost all his work was in connection with the society. He edited the *History of the Jesuits of Paris*, by Père Garasse. Among his works may be mentioned *Banishment of Jesuits from Louisiana*, 1855, *Inedited Documents concerning the Company of Jesus*, 1863-75, and *Historical Notes on Jesuits and the Parliament of the Eighteenth Century*, 1867.

Carballo, Sp. tn in the prov. of La Coruña, with mineral springs. Pop. 14,000.

Carbamide, see **UREA**.

Carbamines, see **ISOCYANIDES**.

Carbazotic Acid, see **PICRIC ACID**.

Carberry Hill, situated in Midlothian, Scotland, 7 m. SE. of Edinburgh. It is noted in hist. as the place where Mary Queen of Scots surrendered to the confederate nobles in 1567.

Carbides, compounds of carbon with other elements. Many were unknown until they were prepared by H. Moissan in the electric furnace. The prin. C. are those of calcium, manganese, iron, aluminium, chromium, barium, strontium, lithium, etc. Of these the most important commercially is calcium carbide, much in demand for the production of acetylene, which is generated by bringing water and calcium carbide into contact (see **ACETYLENE**). Acetylene may be obtained in a similar way from lithium carbide. Other C., as aluminium and beryllium carbide, give methane, while manganese carbide gives methane mixed with hydrogen. Silicon carbide is a stable compound prepared by heating sand and coke in the electric arc; on account of its hardness it is used as a substitute for emery. Silver carbide and cuprous carbide are highly explosive.

Carbine, or **Carabine** (from Fr. *carabine*; corruption from O.F. *calabre*, from Med. Lat. *calabra*, an engine of war), firearm carried by horse-soldiers, usually attached to the saddle. It is no longer used in this capacity; but a self-loading form has replaced the revolver or automatic pistol in the U.S. Army. See also **FIREARMS**.

Carbinol, see **METHYL ALCOHOL**.

Carbinol, Ethyl, see **PROPYL ALCOHOL**.

Carbo, Gaius Papirius, Rom. politician, tribune of the people in 131 bc. He was suspected of responsibility for the death of Scipio in 129. Later he sided with the aristocracy against the popular party, and as consul in 120 successfully defended Lucius Opimius, the murderer of Gaius Gracchus. But in 119 he was himself impeached for having put Rom. citizens to death without trial, and committed suicide.

Carbo, Gnaeus Papirius, Rom. general, b. about 130 bc. He was one of the chiefs of the Marian party, and he was 3 times elected consul. When beaten by Sulla's general, Metellus Pius, he fled to Sicily, where he was taken prisoner and put to death by Pompey's order (82 bc).

Carbohydrates, see **FOOD AND DIET**.

Carbolic Acid, Phenol, or **Hydroxybenzene** (C_6H_5OH), coal-tar product, formerly much used as an antiseptic. It was discovered in coal-tar by Runge in 1834, and has since been observed in the urine of certain animals. For commercial purposes C. A. is prepared from the fraction of coal-tar distillate which comes over between 150° and 200° C. This distillate is treated with caustic soda, which dissolves it out together with other substances. Water is then added, which precipitates some of the hydrocarbons; the solution is afterwards treated with

Knights of Malta (Louvre), are among many impressive works. See R. Hinks, *Caravaggio*, 1953; B. Berenson, *Caravaggio*, 1953.

Caravaggio, Polidoro Caldara da (c. 1495-1543), It. painter, b. Caravaggio. He was first employed to carry mortar for the artists, but Raphael noticed his ability, and he was taught to paint. After the sack of Rome he fled to Naples and then to Messina, where he amassed a large fortune. He was robbed and murdered at Messina. One of his best-known pictures is 'Christ bearing the Cross' (Naples).

Caravaggio, It. tn. in Lombardy (q.v.), 14 m. S. of Bergamo (q.v.). It has a famous pilgrimage shrine, and was the bp.

industry in the world, exporting considerably to the Continent. America produces the greatest number of C.s (roughly 100,000 a year compared with Britain's 24,000). In America C.s are called trailers and over 90 per cent are residential. They are very much larger than those in Britain, averaging 40 ft in length, and are entirely self-contained. On the Continent C.s are becoming increasingly popular: in France over half the C.s are British. They are not, however, used very much for residential purposes yet, being used mostly for touring.

The Caravan Club of Great Britain was first formed in 1907, and was reorganised in 1935 exclusively for motor trailers.



E.N.A.

A CARAVAN IN THE GOBI DESERT

of Michelangelo C. and Polidoro C. (qq.v.). Pop. 10,000.

Caravan: 1. Literally a house on wheels. C.s are usually of the trailer type in Great Britain, except for those of travelling showmen which have motorised chassis, and also those used for motorised banks, laundries, libraries, dark rooms, etc. The C. is often made from aluminium in England and America, but there is an increasing tendency to use moulded plastics (polyester resins reinforced with glass fibre): these plastics are much more elastic, and allow for rougher treatment than aluminium. They are also easier to work, and have a better finish. The maximum size for a C. in Britain is 22 ft long by 7 ft 6 in. wide, and the average length for a touring C. is 15 ft. The C. is amazingly compact and well designed to conform to the road regulations and also to ensure that it is properly balanced as a trailer. For those who cannot afford a house it is ideal. Nowadays some sites have all the amenities of a village, with shops, laundries, educational facilities, and children's playgrounds.

Britain has the second largest C.

It is a national organisation giving advice on all aspects of caravanning, being run on parallel lines to the Automobile Association and the Royal Automobile Club. It is also a social club, and has affiliated clubs in New Zealand and S. Africa.

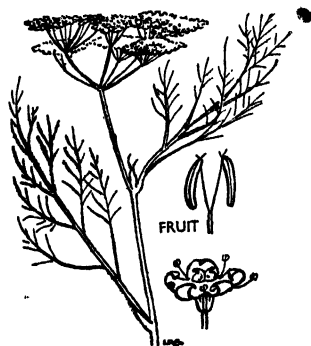
2. (Persian *karwan*, from *kāra*, people, army) Name in N. Africa and the E. for large companies of merchants, pilgrims, or others travelling together for security, especially across the deserts. From the very earliest times C.s have been the chief means for transfer of merchandise in Asia. There are frequent references to them in the Bible (Gen., Job, Isaiah, Psalms). Camels are largely used for transport of heavy goods, especially in arid, sandy regions, as their powers of endurance are so great. Heavy C.s are those in which the camels have a load of 500 or 600 lb., going about 18 to 20 m. a day; in light C.s they only have half that weight, and go about 22 to 25 m. a day. The ordinary seasons for trade C.s are spring, early summer, and later autumn, Friday being the favourite day for the start. The leader of the trade C. is called *Karwan-Bashi*, or *Rais* (chief), and is chosen by

the merchants before starting. He acts as general manager, spokesman, and arbitrator; but in the matter of trafficking each member of the C. acts independently. The word does not occur in English before the early years of the 17th cent.; another form is *carouan*. The trade between Tripoli and the interior of Africa, between Darfur and Egypt, between Russia and China, used to be mainly carried on by C.s. The old Arab trade routes led to Egypt, Syria, and Mesopotamia; and between the 8th and 11th cents. AD Arab traders appear to have gone regularly as far as the Baltic. Many old Arabic coins have been discovered in NW. Europe.

Caravansary, or **Caravanserai**, kind of unfurnished inn where the caravans (q.v.) are put up in E. countries.

Caravel, sailing boat of Portuguese origin, having 3 or 4 masts; much used by navigators of the 15th and 16th cents. The oldest forms were entirely lateen rigged, the foresail being the largest; subsequent types had square sails fitted to the foremast. Another characteristic feature was the square stern. See **CARVEL**.

Caravelas, seaport of Bala, Brazil. It is a centre of the whale fishery of the Abrolhos is. Pop. 2150.



Caraway (*Carum carvi*), biennial herb of the Umbelliferae, grown for its furrowed, halved fruits, known as C. seeds, which are used for flavouring in confectionery, in perfumery, as a carminative in medicine, and in distilling a liqueur; while the roots are sometimes eaten in N. Europe.

Carayon, Auguste (1813-74), Fr. author, b. Saumur. He joined the Society of Jesus, and from that time almost all his work was in connection with the society. He edited the *History of the Jesuits of Paris*, by Père Garasse. Among his works may be mentioned *Banishment of Jesuits from Louisiana*, 1855, *Inedited Documents concerning the Company of Jesus*, 1863-75, and *Historical Notes on Jesuits and the Parliament of the Eighteenth Century*, 1867.

Carballo, Sp. tn in the prov. of La Coruña, with mineral springs. Pop. 14,000.

Carbamides, see **UREA**.

Carbamines, see **ISOCYANIDES**.

Carbazotic Acid, see **PICRIC ACID**.

Carberry Hill, situated in Midlothian, Scotland, 7 m. SE. of Edinburgh. It is noted in hist. as the place where Mary Queen of Scots surrendered to the confederate nobles in 1567.

Carbides, compounds of carbon with other elements. Many were unknown until they were prepared by H. Moissan in the electric furnace. The prin. C. are those of calcium, manganese, iron, aluminium, chromium, barium, strontium, lithium, etc. Of these the most important commercially is calcium carbide, much in demand for the production of acetylene, which is generated by bringing water and calcium carbide into contact (see **ACETYLENE**). Acetylene may be obtained in a similar way from lithium carbide. Other C., as aluminium and beryllium carbide, give methane, while manganese carbide gives methane mixed with hydrogen. Silicon carbide is a stable compound prepared by heating sand and coke in the electric arc; on account of its hardness it is used as a substitute for emery. Silver carbide and cuprous carbide are highly explosive.

Carbine, or **Carabine** (from Fr. *carabine*; corruption from O.F. *calabre*, from Med. Lat. *calabra*, an engine of war), firearm carried by horse-soldiers, usually attached to the saddle. It is no longer used in this capacity; but a self-loading form has replaced the revolver or automatic pistol in the U.S. Army. See also **FIREARMS**.

Carbinol, see **METHYL ALCOHOL**.

Carbinol, Ethyl, see **PROPYL ALCOHOL**.

Carbo, Gaius Papirius, Rom. politician, tribune of the people in 131 bc. He was suspected of responsibility for the death of Scipio in 129. Later he sided with the aristocracy against the popular party, and as consul in 120 successfully defended Lucius Opimius, the murderer of Gaius Gracchus. But in 119 he was himself impeached for having put Rom. citizens to death without trial, and committed suicide.

Carbo, Gnaeus Papirius, Rom. general, b. about 130 bc. He was one of the chiefs of the Marian party, and he was 3 times elected consul. When beaten by Sulla's general, Metellus Pius, he fled to Sicily, where he was taken prisoner and put to death by Pompey's order (82 bc).

Carbohydrates, see **FOOD AND DIET**.

Carbolic Acid, **Phenol**, or **Hydroxybenzene** (C_6H_5OH), coal-tar product, formerly much used as an antiseptic. It was discovered in coal-tar by Runge in 1834, and has since been observed in the urine of certain animals. For commercial purposes C. A. is prepared from the fraction of coal-tar distillate which comes over between 150° and 200° C. This distillate is treated with caustic soda, which dissolves it out together with other substances. Water is then added, which precipitates some of the hydrocarbons; the solution is afterwards treated with

sulphuric acid, when the phenols form an oily layer on top of the liquid. The layer is carefully removed and subjected to fractional distillation to separate the phenols. C. A. is manuf. for military and other purposes by fusing sodium benzene sulphonate with caustic soda. C. A. has a peculiar and characteristic odour, a burning taste, is poisonous, and has antiseptic properties. It crystallises in colourless rhombic prisms which melt at 43° C., and have a boiling point of 182°; its sp. gr. at the melting point is about 1.066. At ordinary temps. it is moderately soluble in water, but it dissolves readily in alcohol, ether, glacial acetic acid, and glycerol. Upon exposure to light and air it deliquesces and assumes a red colour, but its other properties are apparently unaffected. Tests for C. A. are provided by the fact that it gives a violet colour with ferric chloride, and produces a white precipitate with bromine water. C. A. decomposes at a very high temp., benzene, toluene, naphthalene, and other substances being formed. Though called an acid, it is neutral to the usual tests, but forms salts called phenoxides or phenates. The phenates of the alkali metals may be prepared by dissolving the acid in a solution of alkali caustic with the exclusion of air. Phenol forms many substitution products, chlorine and bromine readily forming chlorophenols and bromophenols. It is used commercially for the manuf. of artificial colouring matters, explosives, plastics, dyes, aspirin, etc.

Therapeutics, etc. C. A. is a general germicide, and is used to exterminate such fungoid growths as ringworm. When used in concentrated form it acts at first as a caustic, and afterwards produces local anaesthesia, which is maintained for some hours. It is readily absorbed by the unbroken skin, and may be used to treat a collection of septic matter near the skin surface, but its absorption in this way may produce symptoms of poisoning. A little cotton wool soaked in C. A. often relieves toothache caused by decayed teeth. Internally C. A. is taken in doses of $\frac{1}{4}$ to 2 grains, and is useful in fermentation in the stomach and as an intestinal antiseptic; it is occasionally used to stop vomiting.

Poisoning. Phenol is a nerve poison, and, in concentrated form, a strong caustic. A quantity of 15 grains provides a very dangerous dose. Diagnosis of poisoning by absorption is made by observing the condition of the urine, which assumes a characteristic dark green colour. The usual antidote is sodium sulphate introduced either by the mouth or by intravenous injection.

Carbon, symbol C, atomic number 6, atomic weight, 12.01, non-metallic element of widespread distribution. It occurs in nature in practically a pure state as diamond, and a somewhat less pure state as graphite or plumbago. In combination with oxygen, it occurs in the atmosphere to a small extent, and in combination with metals, notably calcium, forms many important rocks. More important still, however, is its occurrence in every

form of animal and vegetable life, and so many different compounds of C. are met with in living tissues that the study of them is set apart as a special section of the science of chem. under the title of organic chem., which might therefore be rendered chem. of the C. compounds. C. as the chief constituent of vegetable tissues has another special significance, as the proportion of C. determines the characteristic properties of those substances considered as fuel. Thus dry wood contains about 50 per cent of C.; peat, or vegetable matter partly decayed, contains about 58 per cent, if moisture be disregarded; brown coal contains about 66 per cent, excluding moisture; bituminous coal contains about 84 per cent, and anthracite contains sometimes 95 per cent of C. The extent to which the plant matter has been allowed to part with its gaseous constituents therefore determines the percentage of C., and the heating power of a coal-like fuel, and the extent of freedom from smoke increases with the proportion of C. Where the decomposition of the plant tissues proceeds with the elimination of all the oxygen, the resulting product is bitumen, and large deposits of this substance occur in many parts of the world.

Diamond is a crystalline form of C. It is usually found as octahedra or cubes, but many modifications exist. It was first discovered to be a form of C. by Smithson Tennant in 1797, who succeeded in burning the substance in fused nitre and demonstrated the products of combustion to be C. dioxide only. The diamond owes its economic value to its excessive hardness and great brilliance. It is found chiefly in S. Africa and S. America. **Graphite**, blacklead, or plumbago is a mineral occurring in beds or plates amongst the older crystalline rocks, as in Cumberland, the Laurentian Mts, Spain, Bohemia, and elsewhere. It is also artificially produced in electric furnaces, and the greater portion of the raw material for the manuf. of writing pencils is now obtained in this way. It is a dark gray or black mineral with a metallic lustre, and possesses a peculiar greasy softness, so that it leaves a mark on anything with which it comes fairly forcibly in contact. Besides its use for the manuf. of writing pencils, it is commercially important as a dry lubricant. **Amorphous C.** is obtained by burning many kinds of animal and vegetable tissue in a limited supply of air. C. does not readily enter into chemical composition except at high temps., and it is only when oxidation is rapid that C. burns to form C. dioxide. **Lampblack** is a form of C. prepared by burning tar, resin, or turpentine, and condensing the products of combustion. The C. thus collected is a densely black substance with impurities of hydrocarbons. It may be purified by heating in closed vessels, when a fairly pure form is obtained. Its most important property is that it does not reflect light from any angle and it is therefore in demand as a black pigment and as a constituent of printer's ink. C. black, another form of finely divided C., is used as a reinforcing

filler in rubber compounding, especially tyres. Gas C. is a particularly hard and dense form obtained in the distillation of coal in gas-works, apart from the porous form known as coke. Gas C. is a bad conductor of electricity, and is used for the manuf. of rods for electric arc-lights. There are various forms of charcoal obtained by the slow combustion of animal or vegetable matter. Wood charcoal is obtained by burning wood in a limited supply of air. The old method practised by the charcoal-burners of the forests of Europe from time immemorial consists in collecting branches of suitable length and thickness into heaps, which are closely packed in and then covered over with turf. The wood is ignited at the top and sides and allowed slowly to burn towards the centre, the charcoal-burner inspecting the heap from time to time to see that the combustion is regulated by a proper adjustment of the scanty air-holes at the base. Charcoal thus prepared is used as a fuel and as a reducing agent in smelting ores. *Animal charcoal*, or bone black, is obtained by distilling bones in iron retorts. It is usually very impure, but possesses considerable decolorising and absorbent powers, and is used for the purpose of decolorising raw sugar. Charcoal varies in its properties according to the structure of the substance from which it was prepared and the mode of preparation. It has the power of absorbing gases, being capable of absorbing such quantities that they must be in a state of compression analogous to the liquid state. It is to this property that charcoal owes its value as a deodoriser, its affinity for ammonia in particular being very marked. The practice of eating charcoal in the form of charcoal biscuits is based on the expectation that gases causing pain and inconvenience in the stomach and intestines will be thus absorbed. *Active charcoal*, an even better absorbent, is made from ordinary charcoal, peat, or coal by various methods, e.g. by heating first with phosphoric acid, charring, and washing. It is used in respirators, for removing fusel oil from crude spirit, for recovering volatile solvents in dry-cleaning works, for decolorising sugar syrup, etc. Charcoal is used as a reducing agent in the laboratory to separate a metal from its ore. Charcoal, as has been said, is not chemically active at low temps., but at high temps. it combines readily with oxygen in an oxide, giving off C. dioxide, while the metal is extracted pure. Before the widespread use of coal in iron furnaces, wood charcoal was commonly used to reduce the ore, and the process is still used where coal is scarce, as in Sweden. The compounds of C. are numerous and important. With oxygen 2 prin. compounds are formed. C. dioxide (CO_2) is produced whenever C. is burned in excess of air or oxygen. It is a colourless gas, heavier than air, does not support combustion, and is soluble in water, the solution having an acid reaction (see CARBONIC ACID). When wood or coal is burnt without sufficient excess of air, C. monoxide (CO) is produced, as in blast-furnace operations,

etc. It is a colourless, tasteless gas of a poisonous nature (see CARBON MONOXIDE). C. dioxide in association with water acts as a dibasic acid, which forms 2 series of salts with metals, the carbonates and bicarbonates (see CARBONATES). C. is also capable of combining with metals directly in the electric furnace, giving rise to compounds called *carbides* (q.v.). It also combines directly with hydrogen when an electric arc is estab. between C. poles in an atmosphere of hydrogen. The resulting product is *acetylene* (q.v.). C. unites with fluorine to produce C. *tetrafluoride* (CF_4). When heated in sulphur vapour, C. unites with sulphur to form C. *bi- or di-sulphide* (CS_2), a very volatile, colourless liquid, boiling at 46°C . and giving off an inflammable vapour. It has remarkable solvent powers, dissolving fats, india rubber, sulphur, iodine, and phosphorus, which are otherwise difficult to obtain in solution. C. *oxysulphide* (COS) is a colourless, odourless, inflammable gas, produced when C. monoxide and sulphur vapour are passed through a tube at a moderate heat. *Carbonyl chloride*, or *phosgene* (COCl_2), is a colourless, heavy gas with a pungent smell, prepared by the action of sunlight on C. monoxide and chlorine. It is very poisonous. C. and hydrogen unite in many different proportions, giving rise to bodies which are collectively known as *hydrocarbons*. The many other compounds of C. with oxygen, hydrogen, and nitrogen which are associated with forms of living matter are usually classed as *organic compounds*; their number seems to be without limit, for not only have new compounds been isolated through the efforts of chemical research workers, but hitherto unknown substances have been synthesised in the laboratory. See also ALCOHOL; ALDEHYDES; FAT; SOAP; STARCH.

Carbon Dioxide, see CARBONIC ACID.

Carbon Monoxide, CO, gas formed during combustion when the supply of oxygen is not sufficiently large. It is found in chimney gases, in the gases of blast furnaces, and in the vapours arising from volcanoes. It is prepared in the laboratory by the action of concentrated sulphuric acid on formic acid, sodium formate, or oxalic acid, an equal volume of carbon dioxide also being produced in the latter case. C. M. is a colourless, odourless gas slightly lighter than air. It is sparingly soluble in water and burns with a pale blue flame to form carbon dioxide; this flame may sometimes be observed near the top of a coal fire when there is incomplete combustion in the lower part of the grate, or when the carbon dioxide first formed is turned into M. by passing over a heated mass of coal. CO is a very poisonous gas, and is particularly dangerous in coal-mines where it is sometimes formed in small quantities. It is, however, non-poisonous to green plants. Mixed with hydrogen, as 'water-gas' prepared by passing steam over red-hot coke, C. M. is largely used as an industrial fuel. 'Producer gas,' a mixture of C. M. and nitrogen made by burning coke in a limited current of air, is

also an important industrial fuel. C. M. is the starting point for the commercial synthesis of many carbon compounds.

Carbonado (Sp. 'coal'), form of carbon. It is black in colour, is found in pieces as large as the ball of the thumb, and is sometimes used for the boring of rocks.

Carbonari (It. 'charcoal-burners'), members of an It. political secret society, probably formed in the first instance by Neapolitan republicans during the reign of Joachim (Murat). (A C. rising against the French in 1813 was suppressed, and Federici, the C. leader, executed.) It had for its objects the expulsion of strangers from the throne of the country and the estab. of democracy. Its ritual was taken from the trade which gave it its name; thus a lodge of the society was a *baracca*, or hut, an ordinary meeting was called a *vendita*, or sale, an important meeting an *alla vendita*. Mystic religious language was used to explain the aims of the society, 'clearing the wood of wolves was said to be their aim,' alluding to Christ as a lamb torn by wolves. The objects of the society were at first only the expulsion of foreigners, but later became democratic and then anti-monarchical. The C. rapidly increased in numbers, and by 1820 included many of the leading patriots in Italy. After the suppression of the Neapolitan and Lombard revolutions of 1821, Carbonarism was made high treason. After 1821 the C. never quite revived in Italy, and, though active again in 1830-1, they were superseded by the wider 'young Italy' movement of Mazzini (q.v.).

Carbonates, salts of carbonic acid. Carbon dioxide dissolves in water to form a feebly acid solution, and therefore carbon dioxide is regarded as the anhydrous (i.e. without water) form of carbonic acid, H_2CO_3 , which, however, has never been isolated. The acid is dibasic, that is, it contains 2 atoms of replaceable hydrogen per molecule; when both atoms are replaced by a metal, the product is a carbonate, and when one atom only is replaced, the product is an acid carbonate, or bi-carbonate (q.v.). The univalent alkali metals, such as sodium and potassium, yield both C. and acid C. with the general formulae M_2CO_3 and $MHCO_3$. The Cs of sodium, potassium, rubidium, caesium, and thallium are soluble in water, all the others are insoluble. Aluminium and chromium do not appear to yield C., and magnesium, bismuth, and copper yield basic C. If an acid be added to a carbonate, effervescence takes place with evolution of carbon dioxide, and most C. are decomposed by heat into carbon dioxide and the oxide of the metal.

Carbondale, city of Pennsylvania, U.S.A., in Lackawanna co., situated on the Lackawanna R. It is in the midst of the anthracite coal-field of the U.S.A. There are foundries and the manuf. of textiles and metal products. Pop. 16,296.

Carbonear, port of Newfoundland, situated on Conception Bay, 4 m. N. of Harbour Grace. Pop. 3928.

Carbonic Acid, term applied to the substance H_2CO_3 , but formerly to the anhydride carbon dioxide CO_2 , or C. A. gas. Carbon dioxide occurs in the atmosphere to the extent of 3 to 4 volumes in 10,000, though in its the amount may be larger. It occurs also in solution in riv. and sea water, being carried down by rain or liberated from decomposing carbonates in the soil. The gas is produced in large quantities in limekilns, being formed by the decomposition of the chalk or limestone from which the chalk is made. Fermentation and putrefaction give rise to carbon dioxide, which may exert considerable pressure if the processes are carried out in closed vessels. In the laboratory, carbon dioxide is prepared by treating marble or chalk with dilute hydrochloric acid, but it may generally be stated that all carbonates when treated with most acids yield the gas. Carbon dioxide is a colourless gas about 1.5 times as heavy as air, moderately soluble in water; it liquefies at $0^\circ C$. under a pressure of 38 atmospheres. The 'snow' form can be compressed into blocks and such solid has in air, i.e. at 1 atmosphere pressure, at temp. of $-78^\circ C$. It is used in the preparation of aerated waters, quantities being dissolved in water under pressure to produce the sparkling effect when the pressure is at length removed by releasing the stopper of the bottle. Carbon dioxide plays an important part in the making of bread, being generated in the dough by the use of yeast in order to obtain the porous condition which makes bread light and palatable. In the vital processes of animals and plants, carbon dioxide is a necessary factor, for it is a product of the oxidation of waste organic substances occurring in the continuous change of material in the animal economy, and it forms the raw material from which plants obtain the carbon necessary to build up their tissues. Thus plants absorb carbon dioxide and give out oxygen, while animals breathe in air and expel air containing a larger proportion of carbon dioxide. Unless there is adequate ventilation in a room the increasing proportion of carbon dioxide interferes with the proper supply of oxygen to the lungs, and symptoms of suffocation may ultimately appear. Solid carbon dioxide is used as a refrigerant ('dry ice' or 'drikold'), e.g. in the ice-cream and engineering industries.

Carboniferous System, series of stratified rocks which contains the great coal-bearing strata of economic value. The system includes much more than the Coal Measures, and, on the other hand, coal is found in strata unconnected with the system. The C. S. lies above the Devonian or Old Red Sandstone, and below the Permian and Triassic systems. It comprises in the U.K. the lower C. S. or C. Limestone, above which lies the Millstone Grit, and above that the Coal Measures. The C. Limestone may usually be divided into lower, middle, and upper rocks. The lower consists of limestone and shales in the S. and centre of England, and Calciferous Sandstone in Scotland;

the middle consists mainly of limestone; and the upper of black shales with thin limestones. The *Millstone Grit* separates the 2 great systems, and consists of grits, thin coal seams, and limestones. The *Coal Measures* may also be divided into lower, middle, and upper. The lower consists of shales, thin limestones, and coal seams; the middle of the prin. coal seams; and the upper of thin limestones and coal seams, sandstones, and clays. In England the greatest thickness is attained in the N. and W.; this is because the land was at the C. period covered by shallow water and received a considerable amount of sediment from the land to the N., while the S. and E. of England lay under some depth of clear water. The thickness of all parts of the system therefore varies considerably with the locality. With reference to the *Coal Measures*, these are found to a thickness of 8000 ft in S. Wales, 6000 in Lancs, 3000 in the Midlands, Durham, and Northumberland, and about 2000 in Scotland. In Ireland the system is represented chiefly by limestone. In Europe the C. rocks appear in Belgium, in France, in Westphalia, Saxony, and Bohemia. From Russia the system extends northward as far as Spitzbergen, and is continued through S. Siberia into China. C. rocks are also known in Australasia, N. Africa, and S. America, while in the U.S.A. the system is widespread, attaining its greatest thickness in the E., the beds of greatest economic importance being in Pennsylvania and the surrounding dists. In the C. period as represented by rocks in the U.K., the sedimentation is of 2 kinds: marine and continental or lagoonal. In the marine strata the fossils include crinoids, corals, foraminifera, and brachiopods. Remains of many fish are found, including sharks with piercing teeth and others with teeth adapted for crushing crustaceans, etc. In the continental strata are found 6 great groups of plants, including the club mosses, horse-tails, gigantic ferns, etc. Some of the tree ferns have been so well preserved that the minutest details of their structure can be studied. The vegetation appears to have been luxuriant and abundant, and there is evidence that the climate was, if not hot, at least mild and moist. It has been suggested that, owing to continual volcanic disturbances, of which there is abundant evidence, the air was charged with a greater proportion of carbon dioxide than it has now, so that vegetation was proportionately encouraged. The animals of the continental strata include fresh-water molluscs, ganoids, occasional salt-water fish, spiders, cockroaches, locusts, bees, etc., and in the later C. rocks are found large numbers of early amphibians. The economic importance of the C. S. lies mainly in the coal found in Britain, Belgium, Germany, Russia, Japan, and America, but many other products are in continual demand. The C. Limestone yields limestone for the manuf. of lime, bleaching powder, etc. The ironstone found in association with the coal, and ores of zinc, lead, and

antimony found in the limestone, are worked. The sandstones are used for building purposes, and for grindstones, millstones, etc. Fire-clay and terracotta clay often occur, and the various shales are treated for the extraction of oil, sulphur, and sulphuric acid.

Carbonisation (Low Temp.). The manuf. of coke from coal has been carried on since the 17th cent., and the gas industry was founded by Wm Murdoch in 1792. In the ordinary or high-temp. process for producing gas and coke a temp. of about 1000° C. is maintained, but to produce a fuel, or semi-coke, suitable for use in open grates, and also to obtain a higher yield of liquid products, a temp. of about 600° C.—the so-called low-temp. C.—is resorted to.

In 1850 James Young, the founder of the Scottish shale industry, obtained a patent for the purpose, and in 1906 T. Parker took out a patent for the manuf. of 'coalite.' Numerous investigators have worked on the problem, prominent among them being Sir George Bellby (1850-1924). He studied fuel problems all his life, in particular those connected with low-temp. distillation either of shale or coal, and in 1917 was made chairman (honorary) of the newly formed Fuel Research Board. He hoped that the successful low-temp. C. of coal would provide home supplies of fuel oil for the navy and mercantile marine, and he designed the National Fuel Research Station at E. Greenwich with this as one of the aims in view. He was responsible also for the introduction of the therm system of charging for company's gas. Sev. difficulties have appeared in connection with low-temp. C., chief among them being swelling of the coal during treatment and low rate of heat penetration. Many types of plant have been evolved to overcome these and other difficulties, though even now coals which can be treated successfully in one type of plant may be comparative failures in another. This may be modified in the future by pre-treatment of the coal before C. The prin. low-temp. processes are readily divided into 3 classes: (a) externally heated systems; (b) combined external and internal heating systems; and (c) internally heated systems. All these classes include continuous and intermittent retorts or carbonising chambers.

Carborundum, trade name of a proprietary brand of silicon carbide (SiC). It is manuf. by heating together in an electric furnace sand and coke. It is a black crystalline solid, with hardness greater than that of ruby. Its great hardness makes it invaluable as an abrasive, and leads to its use in place of emery.

Carbuncle, abscess of hair follicle or sweat-gland (see SKIN). The infecting organism is nearly always the staphylococcus. A C. differs from a boil (q.v.) only in that more than one follicle or gland are involved, consequently the abscess is larger and the pain and constitutional upset, due to toxæmia, are correspondingly greater. Apart from

size, C.s may be distinguished from boils from the fact that a boil discharges through one opening or 'head,' while a C. discharges through sev. Like all bacterial skin infections, C. is contagious. Abscesses in other skin areas may occur as a result of transference of bacteria by the fingers or other means. Infection of other people may occur from direct contact or from contamination of baths, wash-basins, utensils, etc.

Carbuncle, almandine garnet, so called by the ancients because of its appearance of a glowing coal in certain lights. Cut with concave surfaces it has a dark red colour, but owing to its relative softness it is not very valuable. The best specimens are found in E. Asia, notably Burma and Ceylon; also found in Brazil and U.S.A.

Carburettor, originally an apparatus for charging gas or air with carbon by passing it through a liquid hydrocarbon, usually with the object of increasing its illuminating power. The word is now used to describe a device attached to an internal-combustion engine, which uses volatile, spirituous liquid fuels, e.g. petrol, benzole. Before the fuel can be burned effectively within the cylinder of the engine, it must be finely broken up into very small particles and mixed with air in definite proportions, depending upon the chemical composition of the fuel: usually for petrol about 15 parts of air to 1 part of fuel by weight. The chief function of the C. is to pulverise the fuel and supply it to the engine thoroughly mixed with the correct proportion of air, under all conditions of load variation. In addition, the C. must provide a small reserve of fuel to enrich momentarily the combustible mixture for sudden acceleration or to ensure easy starting. When fixed to aero engines, provision must be made in the C. to alter the mixture strength to suit the conditions met with in the rarer atmosphere at high altitudes.

The earlier C.s were of the 'surface' type, in which a current of heated air was drawn across cotton wicks saturated with petrol. This method usually resulted in an over-rich mixture, which had to be diluted by extra air before reaching the engine cylinder. The C.s generally used to-day are the spray type, in which the liquid fuel is metered through one or more calibrated jets and discharged into a stream of air moving at high speed through a restricted passage called the choke. The effect of the petrol thus impinging is that it is broken up and intimately mixed with the air. Liquid fuel reaches the jets from a small reservoir, called a float-chamber, where it is maintained at a constant level by a float which operates a small valve controlling the supply from the main fuel tank. See also AERO-ENGINES; GAS ENGINES; INTERNAL-COMBUSTION ENGINE; MOTOR CARS; MOTOR CYCLES.

Carbylamines, see ISOCYANIDES.

Caragante, Sp. tn in the prov. of Valencia. It has a fine Baroque church, and is one of the largest orange-producing centres in Spain. Pop. 15,100.

Carcano, Giulio (1812-84), It. poet and novelist, b. Milan, disciple of Manzoni. His first work was *Angiola Maria*, pub. in 1839. He then, with most other It. authors, took part in the fight for the freedom and unification of Italy, and was obliged to go into exile. On his return he became in 1859 prof. at the academy of Milan and was afterwards appointed senator. He wrote numerous works, best known among which are his novels and collections of short stories, often dealing with domestic life: *Racconti Semplici*, 1843, *Damiana*, 1851, and *Dodici Novelle*, 1853; his collections of *Poesie edite ed inedite* (2 vols.), 1861-70, and *Poesie varie*, 1875; and his tragedies *Spartaco*, 1857, *Ardoine*, 1860, and *Valentina*, 1870. He also trans. Shakespeare into Italian, 1874-82.

Carcar, tn on the E. coast of the is. of Cebu, belonging to the Philippines. Coco-nuts and corn are grown, and there is fishing. Pop. 32,818.

Carcase, see CARCASSONNE.

Carcassonne (Rom. Carcaso), Fr. tn, cap. of the dept of Aude, on the Aude and the Canal du Midi. On the l.b. of the riv. is the 'lower' tn, founded by Louis IX in 1247, and crowning a hill on the r.b. is the 'City,' which, surrounded by 2 ramparts and 53 towers, is one of the most curious of medieval fort. tns surviving. The City was fortified by the Visigoths (see under GOTHS), was occupied by the Saracens (q.v.) from 725 to c. 750, and was later a stronghold of the Albigenses (q.v.). In 1346 it successfully resisted the Black Prince, and at the end of the religious wars the lower tn supported Henry IV (q.v.), while the City supported the League (q.v.). C. is the seat of a bishopric, and has sev. very fine churches. It produces excellent wines. Pop. 38,200.

Carcharodon, genus of shark of the family Lamnidae consisting of the single species *C. carcharias*, the great white shark or man-eater. It grows to a length of about 40 ft and is found in all the warm seas of the world. There are a number of authenticated records of it attacking human beings. The young are born alive from the female.

Carchemish, antc city on the W. bank of the Euphrates, N.E. of the modern Aleppo, was N. cap. of the Hittites (2 Chron. xxxv. 20). It is identified with the ruined Jerablus (Hierapolis).

Carco, Francis (1888-), Fr. poet and novelist, b. Nouméa, New Caledonia. He went to Paris when quite a young man, and made his début in authorship with his poems *La Bohème et mon cœur*, pub. in 1912. His greatest successes, however, have been with his novels and short stories dealing with the Parisian underworld and plentifully sprinkled with Apache argot. One of his best-known books is *Jésus-la-Caille*, 1914. Another, *L'Homme traqué*, received in 1923 the grand prize for romances offered annually by the Fr. Academy. His essays and critical works include *Le Roman de François Villon*, 1926, *De Montmartre au Quartier Latin*, 1927,

Envoûtement de Paris, 1938, and *Verlaine*, 1939.

Cardale, John Bate (1802-77), an expert in the knowledge of church hist. and anct liturgies, one of the foremost ministers of the Catholic Apostolic Church (q.v.).

Cardamine, genus of the Cruciferae which is widely distributed. The species are usually smooth herbs, with stalked, entire, lobed, or pinnately cut leaves, and racemes of white or red flowers, commonly known as Bitter-cress. *C. pratensis*, a perennial with lilac flowers in spring, is the Cuckoo Flower or Lady's Smock; *C.*

Educ. at Pavia Univ. and at Padua Univ., where (1526) he took his medical degree. Excluded from the College of Physicians by reason of his birth, his earlier efforts in medical practice were unsuccessful and he was reduced to penury. But through the influence of a Milanese senator, whose child he had cured, he was admitted to the medical fraternity and, in 1534, appointed to the chair of mathematics at Milan. In 1536 he gave the first clear account of typhus fever. A few years later the pub. of his *Practice of Arithmetic* brought him into notice. This was followed in 1545



D. McLeish

THE 'CITÉ,' WITH ITS DOUBLE ENCEINTE, AT CARCASSONNE

amar, also perennial, the Large Bitter-cress; *C. impatiens*, Narrow-leaved Bitter-cress, is an ann. or biennial; *C. flexuosa*, often perennial, the Wood Bitter-cress; *C. hirsuta*, the ann. Hairy Bitter-cress; and *C. trifolia* is a perennial of central Europe which has become naturalised.

Cardamoms, fruit of sev. species of Zingiberaceae from the genera *Amomum* and *Elettaria*. *E. cardamomum* is an Indian plant in which the rhizome produces leafless shoots, and these bear the fruit which, when ripe, yield the spice C. In the species of *Amomum* the same thing occurs: *A. cardamomum* is a native of Sumatra. *A. angustifolium* of Madagascar, the one producing small, the other large C. Grains of Paradise are the fruits of *A. granum paradisi*, and are an inferior quality of C.

Cardan (Cardano), Girolamo (1501-76), It. physician and mathematician, b. Pavia, illegitimate son of a jurist of Milan.

by *Ars Magna*, a treatise on algebra, noteworthy for its exposition of the principle of cubic equations and its solution of geometrical problems by algebra—for the first of which he was indebted to his instructor Tartaglia. In 1551 his fame was estab. by his chief work, the treatise *De Subtilitate Rerum*—speculation in physical phenomena; and this was followed a few years later by its sequel, *De Varietate Rerum*, in which work too he seeks to explain ordinary physical phenomena. But the chief interest of this later work lies in its groping but advanced thought on the inorganic realm of nature, which he suggested was animated no less than organic nature. He afterwards continued the practice of medicine at Pavia and Bologna till 1570. After leaving Bologna he went to Rome, where he d. See H. Morley, *The Life of Girolamo Cardano*, 1854; life by J. Eckman, 1946; O. Ore, *Cardano the Gambling*

Scholar, 1953; autobiography trans. by J. Stoner, 1930.

Cardboard, thick board made by compressing together sev. leaves of paper pulp in the process of manuf. Pasteboard is a form of C., produced by pasting together sev. sheets of paper. Bristol board is a finer kind of C. used for pen-and-ink drawings. Strawboard is a coarse yellow board made from straw pulp.

Carden, Sir Sackville Hamilton (1857-1920) admiral, son of Capt. Andrew C. of Templemore, Ireland. Entered the navy as a midshipman and first saw active service in the Egyptian war of 1882. Served in the Suakin operations and in the E. Sudan in 1894. In 1897 served under Sir Harry Rawson in the Benin expedition, and attained flag rank in 1908. In 1914 he was admiral superintendent of Malta dockyard, and when Sir Berkeley Milne left the Mediterranean Adm. C. became commander-in-chief of that station. He was in command of the naval operations at the opening of the Dardanelles campaign and the destruction of the forts at the entrance, but resigned his command through illness, and was succeeded by Adm. Sir John de Robeck. Created K.C.M.G. in 1916 and promoted full admiral in 1917.

Cardenal, Pierre (d. 1306), Provençal troubadour. He was canon of the cathedral of Puy-en-Velay, his native tn, and his songs consist principally of *servientes*, a name given to the satirical songs of the troubadours, dealing with the vices of the nobility and the clergy. The *servientes* of C. are extremely forceful. He also supported the Albigenses against the crusade of the Catholics. His songs are to be found in Mahn's *Gedichte der Troubadours*, 1856-73.

Cardenas, Lázaro (1895-), progressive constitutional president of Mexico from 1934-40, b. Jiquilpan, Michoacán. He was responsible for many educational and industrial reforms; and was the first president for many years to be normally elected and retire voluntarily after serving the full term. From 1942-5 he was minister of war.

Cardenas, seaport on the N. coast of Cuba, 75 m. E. of Havana, in the prov. of Matanzas. It is one of the chief sugar exporting tns of the is., and is a leading fishing centre. It has a good harbour and is well served by railways. Pop. 37,000.

Cardia, opening in the upper part of the stomach by which the oesophagus enters. As its name indicates it is close to the heart.

Cardiff (Welsh *Caerdydd*), city and co. bor., parl. bor., seaport, and the co. tn of Glamorganshire, S. Wales, on the l. b. of the R. Taff. C. was made cap. of Wales, Dec. 1955. C. has made greater and more rapid progress than perhaps any other tn in the U.K., and this was begun by the opening of its first dock in 1839. The docks known collectively as Bute Docks, in commemoration of the parts played by the marquesses of Bute in the early days of the port, have a total deep-water area of 165 ac., with a quayage of 33,750 ft, equipped in every detail and providing

facilities for the handling of all classes of traffic, comparable with those at any other Brit. port. Transit sheds, etc., have a floor space of 1,012,252 sq. ft, which includes a modern cold-storage plant capable of accommodating 10,000 tons of frozen meat. C. is an important commercial centre, and it was formerly one of the largest coal-exporting ports in the world, but since the shortage of coal



Craely's Studios Ltd, Cardiff
THE PARISH CHURCH, CARDIFF

supplies available for export this trade has been considerably affected. It exports considerable quantities of iron, manuf. iron and steel goods, and general cargo of all descriptions. The import trade is considerable, and includes large quantities of bulk commodities such as timber, pitwood, grain, iron ore, pig-iron, etc., also all sorts of manuf. goods, fresh and dried fruit, fish, frozen and chilled meat, live cattle, and many other commodities comprising the needs of the large pop. served by the port.

Ship repairing is an important industry in C., and in addition to the great iron and steel concerns there are milling, brewing,

paper making, wire ropes, biscuit making, enamel ware, and hollow-ware industries, together with a large number of light industries, giving a general industrial pattern of great diversity.

C. was raised to city status by royal charter in 1905. Its hist. is very fascinating, and C. Castle in particular is a unique object lesson. From the 1st cent. AD, when the Romans estab. their fort, the site has been in almost continuous occupation. Rom., Norman, medieval, and later builders have all left their traces upon it. The castle was presented to the citizens of C. in 1847 by the Marquess of Bute. The interior, which is famous for its decorations, is seen by about 100,000 visitors annually. C. is noted for its parks and open spaces, and the Civic Centre in Cathays Park is one of the world's finest. Here are the City Hall, Glamorgan Co. Hall, Welsh College of Advanced Technology, the Univ. College of S. Wales and Monmouthshire, Temple of Peace, and the National Museum of Wales. The cathedral of Llandaff is situated 2 m. to the NW. in a suburb of the city. The city sends 3 members to Parliament. Pop. (1954) 246,600.

Cardigan, James Thomas Brudenell, 7th Earl of (1797-1868), cavalry officer, b. Hambledon, Hants. He commanded the 15th and 11th Hussars and was constantly in dispute with his officers. He served in the Crimea, during which campaign he led the famous charge of the Light Brigade at Balaklava, 1854. Afterwards he was inspector-general of cavalry, 1855-60, and lieutenant-general, 1861. See Cecil Woodham-Smith, *The Reason Why*, 1953.

Cardigan, seaport tn, a municipal bor., and the co. tn of Cardiganshire in S. Wales. It stands on the r. b. of the R. Teifi, about 5 m. inland from St George's Channel. It contains the ruins of a castle supposed to have been built in the 12th cent. Pop. 3500.

Cardigan Bay, wide inlet of St George's Channel stretching from Braich-y-Pwll in the N. to Strumble Head in the S. It washes the shores of 5 Welsh cos., among them being Cardiganshire.

Cardiganshire, co. of S. Wales, washed on the W. by Cardigan Bay, and extending from the mouth of the Dovey to the mouth of the Teifi, bounded on the S. by Pembroke and Carmarthen, and on the E. by Brecon, Radnor, and Montgomeryshire. Traces of early Brit. camps are scattered over the co., and there are remains of Rom. roads and military stations, and inscribed stones. The ruins of Strata Florida Abbey (12th cent.), SE. of Aberystwyth, are also of interest. The surface of the co. is comprised of Cambrian and Silurian rocks, and the interior is very mountainous. Its culminating point, Plynlimon (2469 ft), lies in the NE. The most important rvs. are the Teifi, the Rheidol (with the Rheidol Falls spanned by the Devil's Bridge), the Ystwyth, the Aeron, and the Towy, though the Teifi is the chief. The prin. occupation is agriculture. In the N. and NE. there are large sheep farms, while in

the lower parts of the co. milk production plays the main part in farming activity. The H.Q. of the Welsh prov. of the National Agric. Advisory Service is at Trawscoed, and there is a large milk collecting and processing factory at Felinfach. There are a number of small, interesting woollen mills, with a considerable amount of tourist traffic at the coastal resorts of Borth, Aberystwyth, Aberayron, New Quay, and Aberporth. The rvs. and lakes are noted for freshwater fishing, while coracle fishing still survives on the R. Teifi. Formerly the mineral deposits of lead, copper, and zinc were mined. The chief tns are Cardigan (the co. tn), Aberystwyth, and Aberayron, all on the coast, and Tregaron, Lampeter, and Llandysul in the valley of the Teifi. C. sends 1 member to Parliament. Area about 690 sq. m.; pop. 53,750.

Cardinal (principal, from Lat. *cardo*, hinge), title of the highest dignitary, next to the Pope, of the Church of Rome. The word is still used adjectivally, meaning pre-eminent. Originally of more general application, the title was later reserved especially for members of the Sacred College at Rome (1568, by Pius V). The Pope is not obliged to consult them, but usually does, and they form his council or senate. They are all appointed by the Pope alone. As early as the 5th cent. priests permanently ruling par. churches in Rome were called C. priests. There were also C. deacons, who administered the charities of a particular region of the city, and C. bishops in charge of the suburban sees of Rome (Porto and Santa Rufina, Sabina, Albano, Frascati (Tusculum), Palestrina, Ostia, and Velletri). Hence the title was always given to one on whom eccles. affairs 'hinged,' but the 3 bodies did not form the one Sacred College till the 12th cent. The C.s are the chief members of the 21 sacred congregations (standing eccles. committees) of the papal gov., such as holy office, rites, index, studies, propagation of the Faith. They meet in consistory, usually with the Pope as president. They are most prominent on the Pope's death, as they elect his successor, usually one of their own number, this being a special duty of the Sacred College. Pope Sixtus V in 1586 fixed the number of C.s at 70 (6 bishops, 50 priests, 14 deacons). The numbers always varied greatly before, and may still do so, but the number of C. bishops remains 6. About half are of It. birth and live in Rome, except the priests. Those of foreign birth are known as protectors. The first C. bishop (of Ostia) is dean of the Sacred College, and has the right of consecrating the Pope, if he be not already a bishop at the time. The first C. deacon may proclaim and crown the new Pope. The 'Camerlengo,' who rules the church during a papal vacancy, is a C. C.s have the title 'Most Eminent Lord' (Eminentissimo Signore). Among Eng.-speaking C.s are the archbishops of Sydney (New S. Wales), New York (U.S.A.), Westminster (London), and Armagh (Ireland). C.s enjoy an income out of the papal treasury. They

are often sent as papal representatives on delicate missions, as *legati a latere*. They wear a distinctive scarlet dress and red cap (biretta), given them by the Pope. A red hat is also given them in a public consistory, but they do not wear it, and they receive the C.'s ring from the Pope.

Cardinal-bird, or **Redbird**, species of *Cardinalis* of the passeriform Fringillidae, or finch family. The birds are very sweet singers which inhabit N. and S. America, and are often kept in captivity. The general colour of the male is red with a bright red crest and black forehead and throat.

Cardinal Points, see COMPASS, MAGNETIC.

Cardinal Virtues, recognised by the ancients to be Justice, Prudence, Temperance, and Fortitude, and so named because all other forms of virtue were regarded as hingeing or turning upon them (Lat. *cardo*, a hinge). Such classification can be traced back to the time of Socrates. In Catholic theology these virtues are classified as moral virtues in contradistinction to the theological virtues, Faith, Hope, and Charity.

Carding, process for combing the fibres of wool, cotton, etc. This is done to remove all impurities, and to separate the imperfect from the perfect fibres, and so prepare the latter for spinning.

Cardington, vil. of Beds, England, 3 m. from Bedford. Formerly airships were built here; C. now forms an R.A.F. camp. Here was the home of John Howard (q.v.), the prison reformer. Pop. 350.

Carditis, inflammation of the endocardium, myocardium, and pericardium (see HEART). The commonest causes of acute carditis are rheumatism and the toxæmias and infectious diseases. Chronic C., more frequently met in the myocardium, is usually associated with arteriosclerosis due to old age.

Cardona, Sp. tn in the prov. of Barcelona, on the Cardoner. It has a Gothic church and a fortified castle. SW. of the tn is the 'Salt Mt.', containing valuable salt mines. Pop. 5300.

Cardoon (*Cynara cardunculus*), family Compositae. The C. is grown for its thick fleshy stalks and the ribs of the leaves which are eaten; it is cultivated after the manner of celery, coming into season by the middle of Nov. Originally a native of Spain, it now flourishes in the Pampas, having been introduced into S. America for cultivation.

Cardozo, Benjamin Nathan (1870-1938), Amer. jurist, b. New York, 24 May, of Jewish parentage; educ. at Columbia Univ. He was admitted to the New York Bar, 1891, and elected justice of the Supreme Court of New York for term 1914-28. In 1927 he was made chief justice of the Court of Appeals of New York state. On the resignation of O. W. Holmes in 1931, C. was recommended by all the leading Bar associations as his successor, and on 15 Feb. 1932 he was appointed associate justice of the Supreme Court of the U.S.A. In many of his judgments he strongly supported President Roosevelt's policy of the New

Deal. He was noted for his learning in the philosophy of the law as well as in its application. His pub. include *The Nature of the Judicial Process*, 1921, *The Growth of the Law*, 1924, and *Law and Literature and other Essays*, 1931.

Cards, par. and vil. of Dumbarton-shire, Scotland, on the Firth of Clyde, 3½ m. NW. of Dumbarton. Robert Bruce d. in C. Castle (now quite disappeared) in 1329. Tobias Smollett, the novelist, was b. at Dalquhurn House near Renton, in this par. Pop. 6500.

Cards, Playing. The origin of playing C. is uncertain, though it was probably in the E. Leaving undecided the question of how C. reached Europe, it is equally hard to decide the date when they first appeared in Europe. Italy is generally considered the country of origin. Tiraboschi, in his *Storia della Letteratura Italiana*, quotes a MS. of 1299, in which C. are expressly referred to, and other references are to be found between 1300 and 1350. In France C. are mentioned in the *Annals* of Provence about the year 1361, and also in the *Chronicle* of Petit Jean de Saunte in the reign of Charles V, in a decree by that king against gaming in 1369, and in a MS. entitled *Renard le Contrefait*, dated between 1328 and 1341. In Germany C. are mentioned as being permitted in 1380, so must have been introduced before that date—probably about 1350. In England a regulation forbidding the importation of C. is found in the Parliament Rolls of 1464, and it is reasonable to place their appearance about 1450. From the game of *trappola*, consisting of 36 C., the *tarots* of Italy were derived. A pack consists of 78 C. made up of 4 suits, viz.: cups or chalices, swords, money, batons or clubs. Each suit is comprised of 14 C., i.e. numerals 1-10, and 4 court C.: king, queen, chevalier or knight, and valet. In addition there are 21 *alous*, numbered 1-21, and *Il Pazzo* (the Fool or Joker). The first 5 *alous* are known as *grands alous*, the last 5 as *petits alous*. They are allegorically representative of material forces—natural elements, virtues, and vices. The 4 suits are ascribed to represent the 4 estates of man, viz.: the church, the nobility, the merchants, and the peasants. From the 56 C. were evolved the 52-card Eng. and Fr. packs, and also the 48-card Sp. and the 32-card Ger. packs. The *tarot* emblems are still used in It. and Sp. C.; on Ger. C. hearts, bells, acorns, and leaves take their place. Eng. and Fr. C. have spades, hearts, diamonds, and clubs. In the reign of James I the excise tax on C. was 6s. per gross of packs. This tax was varied from time to time until 1862, when it became 3d. per pack, and it has remained at that. There is, in addition, an excise licence to sell of £1. Imported C. bear a duty of 3s. 9d. per dozen packs. It is estimated that some 4 million packs are sold per annum in Great Britain. Until 1832 C. were laboriously and expensively produced from stencils or printed entirely by hand. In that year Thomas de la Rue,

founder of the firm of Thomas de la Rue & Co. Ltd. was granted royal letters patent by William IV for the printing of cards by the typographical process, made possible by his experiments resulting in the production of oil inks which dried quickly and did not 'set off,' and his method of imparting a high gloss finish. This method revolutionised the production of C. and he is regarded as the originator of the modern playing C.

Carducci, Bartolommeo (1560-1610), It. painter, better known by the Sp. form of his name, Carducho. He studied architecture and sculpture with Ammannati and painting with Zuccaro. He helped Zuccaro to paint the great cupola at Florence, and went with him to Spain, 1585. There he became painter to Philip II and Philip III. With Tibaldi he painted much in the Escorial. He also began a series of frescoes, finished by his brother, Vincenzo (q.v.). His best work was 'The Descent from the Cross,' in San Felipe el Real at Madrid.

Carducci, Giosuè (1836-1907), It. poet, b. Val di Castello in Tuscany. He was the son of a physician, and began life as a teacher. He spent a youth of severe study, and was appointed in 1860 to a professorship of It. literature at the univ. of Bologna. This post he held until his death, with the exception of a short interval in 1867, when he was suspended for participation in the movement for the unification of Italy. In 1876, having become a supporter of the Savoy dynasty, he was made member of the It. parliament. His poetry bears the impress of his erudition, and is frequently pedantic and recondite. His earliest verses, afterwards pub. as *Juvenilia*, have little merit, and are modelled upon Alfieri and Manzoni. His best poems were written during the period 1860-70 following upon his appointment at Bologna, and were pub. under the title of *Decennalia*. They deal mostly with the political events of the time and include his famous poem, *Inno a Satana*, 1863, which eulogises the spirit of revolt and resurgence against effete custom and worn-out institutions. The *Decennalia* show a liberation from the earlier influences, which become more complete after 1870, when C. adopted Hugo as his model and gave freer expression to his political views. His most esteemed poems are the unrhymed *Odi Barbare*, 1877, 1882, and 1889, which, written in metres taken from Horace, place him, by their eloquence, dignity, and impressiveness, high in the ranks of classical writers. Other characteristic poems exalting the classical pagan spirit are *Canto di Marzo*, *In una chiesa gotica*, *Classicismo e Romanticismo*. In 1906 C. received the Nobel prize for literature. His complete works were pub. in 21 vols., 1889-1928. See life by B. Croce, 1927; A. Galletti, *L'Opera di Giosuè Carducci*, 1929; S. E. Scalia, *Carducci: his Critics and Translations in England and America*, 1881-1932, 1937.

Carducci, Vincenzo (1568-1638), painter, brother of Bartolommeo (q.v.), under whom and Zuccaro he studied. He went

with his brother to Spain, 1585, and after his death finished a series of frescoes begun by his brother for Philip III, adopting the hist. of Achilles instead of Charles V.'s life. He painted some 50 large pictures for the Carthusians of El Pualar, representing scenes from the life of St Bruno, and martyrdoms and miracles of the monks of that order. He wrote, in Castilian, *Dialogos de las excelencias de la Pintura*, 1633.

Carduchi, race of people who formerly inhabited the mountainous dists. of modern Kurdistan and are probable ancestors of the Kurds (q.v.).

Carducho, Bartolommeo, see CARDUCCI.

Carduus, see THISTLE.

Cardwell, Edward (1787-1861), historian, b. Blackburn, Lancs. He was Camden prof. of ant. hist. (1826-61), rector of Stoke Bruern in Northants (1828), and principal of St Alban's Hall, Oxford (1831). His pub. include an ed. of Aristotle's *Ethics*, a students' ed. of the Gk Testament, 1837, *Documentary Annals of the Reformed Church of England from 1546 to 1716*, 1839, *History of Conferences*, etc., connected with the Revision of the Book of Common Prayer, 1840, and *Reformatio Legum Ecclesiasticarum*, 1850.

Cardwell, Edward Cardwell, 1st Viscount (1813-86), statesman, b. Liverpool; educ. at Winchester and Balliol College, Oxford. He became a barrister in 1838 and M.P. for Clitheroe in 1842. Sir Robert Peel made him secretary of the Treasury (1845-6). In Lord Aberdeen's ministry he was president of the Board of Trade (1852-5), and under Lord Palmerston became secretary for Ireland (1859-1861), Chancellor of the Duchy of Lancaster (1861), and while secretary for the colonies (1864-6) put an end to transportation. In Gladstone's ministry he was secretary for war (1868-74), and he carried out in 1871-2 his great plan of army reorganisation, abolishing the purchase of commissions, introducing the retirement of officers, the short-service system, and, above all, infantry organisation of linked battalions (see also ARMY and HALDANE). Raised to the peerage in 1874 as Viscount C. of Ellerbeck. See Sir R. Biddulph, *Lord Cardwell at the War Office*, 1904.

Cardwell, tn and shire of Queensland, Australia; it is 800 m. N. of Brisbane. Sugar and fruit are grown locally, and timber is produced. Pop.: tn, 520; shire, 4600.

Care, or Carle, Sunday, Sunday preceding Palm Sunday, so called from the practice of eating carlings, i.e. peas roasted or fried in butter, on this day.

Carême, Marie Antoine (1784-1833), Fr. chef, b. Paris, who became cook to Talleyrand, the Fr. plenipotentiary. He accompanied his employer to the congress of Vienna. Subsequently he became chef to the Eng. prince regent (afterwards George IV) and to the empresses of Russia and Austria. He was famed for the artistic nature of his dishes. He wrote *Les Dîners de l'Empereur Napoléon*, *La Cuisine française*, *Le Maître d'hôtel français* and other culinary works.

Carentan, Fr. tn in the dept of La Manche, 25 m. W. of Bayeux. It is a busy market, and has the ruins of an ancient castle. Pop. 4300.

Carew, George, Earl of Totnes and Baron Carew of Clopton (1555-1629), soldier and nobleman. He studied at Oxford, and afterwards fought in the Irish wars against the Earl of Desmond. In 1596 he led a successful expedition to Cadiz, and was afterwards appointed lord president of Munster, where he ruthlessly suppressed the Irish rebellion. C. preserved and annotated all letters and papers relating to the Ireland of his own day, and many vols. of his MSS. on Irish affairs were placed by Laud in the Lambeth Library, while others are among the Harleian MSS. They throw considerable light on the Elizabethan and Jacobean administration in Ireland. He was a great friend of Sir Walter Raleigh, and pleaded with James I on Raleigh's behalf in 1618.

Carew, John Edward (1785-1868), Irish sculptor, b. Waterford, but came to London in 1809, where he d. He exhibited at the Royal Academy from 1830 to 1848. His best statues are 'Whittington listening to the London Bells,' 'The Death of Nelson at Trafalgar,' and the 'Model of a Gladiator.'

Carew, Sir Nicholas (d. 1539), Eng. courtier and favourite of Henry VIII. related to Anne Boleyn (q.v.). He attended Henry in France, 1513, and was knighted before 1517, when he became keeper of Greenwich Park. He was executed for his share in the Marquess of Exeter's conspiracy.

Carew, Richard (1555-1620), poet and antiquary, b. Cornwall. He studied at Christ Church, Oxford, and was appointed high sheriff of Cornwall in 1586. His *Survey of Cornwall*, 1602, is valuable as an account of the life of a country gentleman of the time. He also trans. the first 5 cantos of Tasso's *Gerusalemme Liberata*, 1594.

Carew, Thomas (1595-1639), poet and courtier, b. West Wickham. He was educ. at Oxford, afterwards leading a somewhat wandering life. For a time he travelled as secretary with his kinsman, Sir Dudley Carleton. He went on embassies to Venice, Turin, and to France (1619), and was later attached to the court of Charles I. C. wrote *Coelum Britannicum*, a masque, 1634, short poems, and sonnets addressed to a 'Cella.' His poems show Donne's influence. He was one of the poetic circle that surrounded Ben Jonson, and was a friend of Sir John Suckling. His collected works were ed. by Arthur Vincent, 1899. See G. Williamson, *The Donne Tradition*, 1930.

Carex, or **Sedge**, family Cyperaceae, a genus of about 1000 species of grass-like, perennial rhizomatous herbs, found chiefly in damp, swampy places and wet moors throughout the world. The stems are 3-cornered and solid, with 3-ranked leaves, and monocious flowers in spike-like panicles, as a rule; the male flowers, with 3 stamens in the axils of the glumes,

being of the terminal spike; the female with 2-3 united superior carpels below; the fruit is a nut in the perigynium. The leaves are minutely toothed, and sharp. Among those common in Britain are *C. arenaria*, Sand Sedge, used as a binder of sands, *C. flava*, Yellow Sedge, *C. sylvatica*, Wood Sedge, *C. vesicaria*, Bladder Sedge, *C. panicea*, Carnation Sedge, *C. nigra*, Common Sedge, and *C. pulicaris*, Flea Sedge.

Carey, Henry (c. 1687-1743), humorous poet and musician, reputed son of George Savile, Marquess of Halifax. He studied music under Roseingrave and Geminiani. C. was author of the libretto to *The Dragon of Wantley* (music by Lampe, 1737); he pub. 6 cantatas, 1732, and *The Musical Century*, 1737. His famous *Chrononhotontologos*, 1734, is a burlesque on the mouthing plays of his period. His *Poems on Several Occasions*, 1729, were praised by Addison. His name is best remembered for the ballad *Sally in our Alley*, but the present tune is not C.'s. C. was said to be author and composer of *God save the King*, but the claim was unfounded. His poem *Namby Pamby*, in ridicule of Ambrose Philips (q.v.), added an expression to the language. His granddaughter was mother of Kean, the tragedian.

Carey, James (1845-83), Irish revolutionary, b. Dublin. He became a Fenian (see FENIANS) and one of the originators of the Invincibles (q.v.). He took part in the murder of Lord Frederick Cavendish (q.v.) and Mr Thomas Burke, permanent under-secretary for Ireland, on May 1882, but tried to save himself by turning queen's evidence. He was, however, murdered in revenge soon afterwards on board ship, near the Cape, by Patrick O'Donnell.

Carey, Sir Robert (c. 1560-1639), diplomat and soldier, youngest son of Lord Hunsdon, served Queen Elizabeth I as an envoy in Scotland and the Netherlands, and fought in the Netherlands, 1587. He carried the news of the queen's death to Edinburgh in only 60 hours. He was created Earl of Monmouth by Charles I in 1626, but the title d. with him. His *Memoirs* (ed. 1808) contain an interesting record of Border hist.

Carey, William (1761-1834), Orientalist and missionary, b. Paulerspury. Northants; 1786, shoemaker, schoolmaster, and Baptist pastor at Moulton; 1789, minister in Leicester. Active in forming the Particular Baptist Society for Propagating the Gospel amongst the Heathen (1792), in 1793 he went as a missionary to Bengal. He issued Bibles in 26 Indian languages; he also pub. grammars (of Mahratti, 1805; Sanskrit, 1806; Panjabi, 1812; Telinga, 1814; Bhotanta, 1826) and dictionaries (of Mahratti, 1810; Bengali (3 vols.), 1818; Bhotanta, 1826), and ed. the *Rāmāyana*, 1806-10, and Roxburgh's *Flora Medica*. He was prof. of Sanskrit at Fort William College, Calcutta, 1801-1830. In 1807 he was made D.D. by Brown Univ., U.S.A. See biographies by George Smith (Everyman's Library) and S. Pearce Carey, 1923.

Carfin, vil. in par. of Bothwell, Lanarkshire, Scotland, notable for a grotto laid out on similar lines to that of Lourdes. Many Catholic pilgrims visit it annually. Pop. 2000.

Cargados, Carajoes, or St Brandon, group of is. on the Nazareth Bank, lying 250 m. NNE. of Mauritius, of which they are a dependency. There are fishing and meteorological stations.

Cargill, Donald (1819-81), Covenanter, b. Rattray, Perthshire. He was made minister of Glasgow in 1855, but deprived of his living for opposing the Restoration (1860). He fought at Bothwell Bridge (1879), became a field preacher, and took part in the Sanquhar declaration (1880). Soon afterwards he excommunicated the king and his officials at Torwood, near Stirling, for which act a reward was offered for his capture. Executed at Edinburgh.

Cargo, see BILL OF LADING and FREIGHT.

Cargo Cults, cults that appeared in the years after the Second World War among many peoples of Melanesia. The chief element was a belief that ancestors would arrive in aeroplanes and landing-craft (as did the Jap. and Amer. troops who fought in the area), bringing vast stocks of goods of all descriptions (the 'cargo'), which would herald a millennium of freedom and luxury. See M. Mead, *New Lives for Old*, 1956.

Carham, par. and vil. in the co. of Northumberland, England, in the rural dist. of Glendale. C. is situated on the R. Tweed, and was formerly the scene of fierce struggles between Scots and English.

Caria, anct maritime prov. of Asia Minor, bounded by Ionia and Lydia on the N., the Aegean Sea on the S., and Lydia on the E. The country is mountainous, its chief heights being over 3000 ft, while Mt Latmus reaches the elevation of 4500 ft. The coast is irregular and deeply indented, being fringed with numerous is., chief among which are the Gk is. of Rhodes and Cos. The Carians were originally a distinct nationality and maintained themselves in the interior against the Greeks, but were afterwards subdued by the Persians. The country was conquered by Alexander the Great, and became finally part of the Rom. Empire. It now forms part of Turkey.

Cariama, *Dicholophus*, or *Seriema*, genus of S. Amer. birds, resembles the secretary bird, and is often placed near it among the Falconiformes. Internally, however, it is nearer to the Gruliformes, and the family Cariamidae is now usually classed under that tribe. *C. cristata*, the seriema or crested screamer, is a common species with long legs, short wings, short and slightly hooked beak, a well-developed crest, and long tail. Easily domesticated and will guard its owner's fowls when tamed.

Cariban, see CARIBS.

Caribbean Federation, estab. by the British Federation Act, 1956, and the W. Indies Order in Council, 1957. The C. F. comprises Anguilla, Antigua, Barbados,

Dominica, Grenada, Jamaica, Montserrat, St Kitt's, St Lucia, St Vincent, Trinidad, and Tobago (qq.v.). It was recommended that the cap. of the federation should be at Chaguaramas (q.v.) on Trinidad. Lord Hailes was appointed first governor-general and took up his appointment in Jan. 1958. See also WEST INDIES, *West Indian Federation*.

Caribbean Regiment, see WEST INDIA REGIMENT.

Caribbean Sea, part of the Atlantic Ocean that lies between the coasts of S. and Central America and the is. of Cuba, Haiti, and Puerto Rico and the Leeward and Windward Is. It communicates with the Gulf of Mexico by the Yucatan Strait, and is divided into 2 basins, both in parts over 20,000 ft deep, by a broad submarine bank less than 6000 ft deep lying between Jamaica and Honduras. The E. and larger basin has an area of 231,000 sq. m. The W. basin is considerably smaller. The 2 basins are united by a strait between Jamaica and Cuba and Haiti. The sea forms the turning point of the Gulf Stream. See G. H. Blakeslee (ed.), *Mexico and the Caribbean*, 1920, and A. Waugh, *The Sunlit Caribbean*, 1948.

Caribbee Islands, see ANTILLES.

Cariboo, dist. of Brit. Columbia extending on both banks of the Fraser R., near its source. It is important on account of its gold-mines.

Caribou, see REINDEER.

Caribs, or **Caribbees**, name (first used by Columbus) of a predatory, warlike people of S. America. They were expert seamen and, according to the latest views, spread from S. America northwards, occupying the Lesser Antilles, near what is still called the Caribbean Sea, by conquest of the original Arawakan tribes. They were distinguished for ferocity and cruelty, and made a bold resistance to the Spaniards. Carib is said to mean valiant man. They were cannibals, the word cannibal itself being a variant of Columbus's 'caribal' (derived from their tribal name). See CANNIBALISM. To put an end to the constant disturbances caused by the C., the Brit. Gov. in 1796 deported nearly all of them from Dominica and St Vincent to Ruatan Is. off Honduras. They numbered about 5000, and have since spread over the nearby mainland, the majority being now settled in Honduras, Nicaragua, and on the Guiana coasts. They are usually slight in figure, but strong and well-formed. They were described at the discovery of the new world as 'the strongest, handsomest, and most intelligent' natives of that part. They are reddish-brown in colour, with long, thick, black hair, and Mongoloid features. They drink quantities of *paiwari* (liquor made from the cassava plant). Through admixture with Negroes some are known as Black C. The C. were partly an agric. people, and made good pottery. The modern tribes are far more peaceful than the anct. They no longer have communal dwellings, but separate families, each in its own house. Their religion is ceremonial, and they practise

Tenniel (1850-1900), C. S. Keene (1851-1891), Du Maurier (1860-96), Linley Sambourne (1871-1910), Harry Furniss (1880-1925), E. T. Reed (1890-1920), Sir Bernard Partridge (1901-25), and others gave much of their best work in *Punch*, either in political C. or in illustration of jokes. C.s of prominent people gained an especial vogue in the pages of *Vanity Fair* with the work of 'Ape' (Carlo Pellegrini) and 'Spy' (Leslie Ward). Among other political cartoonists of the time mention must be made of W. Bowcher in the periodical *Judy* and Gordon Thomson in *Pun*. The introduction of photo process-engraving in the early seventies freed artists from their hitherto dependence on wood-cut technique, and was thus an important encouragement to C. of a wider range and versatility. The charming sketches of Randolph Caldecott (1846-86), the fun and pathos of Phil May, and the brilliant work of artists such as 'F. O. G.' (Sir Francis Carruthers Gould), Sir Max Beerbohm, and others, have helped to place Eng. humorous art in the very first rank. Gould was the first cartoonist to draw daily for a newspaper, the *Westminster Gazette*, and Max Beerbohm's wit found expression in his drawings of humorous situations in which he placed the leading figures of his day, mostly from the world of letters. His drawings were of the simplest in outline. Phil May, although Eng. born, began his career with his work for the *Sydney Bulletin*, a periodical in which an Amer. artist, Livingstone Hopkins, also made a name for political and social satire. Will Dyson also graduated from the *Sydney Bulletin* to become well known in England during the First World War and for many years after it for his hard-hitting political cartoons, reminiscent of Gillray. Australia has continued to provide a flourishing field for the caricaturist. Norman Lindsay is only one among many names. Another Australian paper, the popular *Smith's Weekly*, provides an outlet for well-executed cartoons, although somewhat gross in taste, on political topics. As mentioned above, the word C. has to-day given place to cartoon, and this latter word, which in its primary significance meant a picture of a larger size than usual in a paper or periodical, is now applied to any political or social C. of any size whatsoever. In connection with humorous illustration, which is a C. of life and often combined with the creation of characters, mention must be made of Wm Heath Robinson with his whimsical inventions, George Belcher, and Bruce Bairnsfather, the creator of 'Ole Bill,' a prominent character of the First World War. In the thirties, however, the illustrated joke began to show a decline in popularity and the comic situation picture with little or no explanation in words came into vogue. In the connection H. M. Bateman, 'Fougasse' (Kenneth Bird), and 'Pont' became acknowledged masters. Meanwhile, the London daily newspapers, taking their lead from the *Westminster Gazette*, made a regular feature of the cartoon. Some prominent

cartoonists, e.g. 'Poy' (Percy Fearon) of the London *Evening News*, delighted in very small cartoons of no pretensions to artistic merit, with serial characters like 'John Citizen' and 'Dilly Dally,' symbolical of the gov. 'mandarin,' which became familiar through repetition. David Low, on the other hand, the Australian-born cartoonist and probably the best-known cartoonist in England of his day, indulges in bold outlines with considerable artistic merit. He possesses a keen political sense, and his satires in the *London Star* and, later, in the *London Evening Standard* on political and social life, were full of sting but sometimes coarse. In particular, his cartoons on Hitler, Goering, and other Nazi leaders before and during the Second World War were unrivalled. In a lighter vein the cartoons of Sidney Strube, the creator of the 'Little Man,' though intentionally devoid, like those of 'Poy,' of artistry, were always popular and apposite. W. K. Haselden of the London *Daily Mirror* became known for light social satire, and the work of the cartoonist as a sports cartoonist found its pioneer in Tom Webster. Social caricature to-day is well represented by the grotesque families in an elaborately drawn setting of Gilles of the *Daily Express*, and the schoolgirls of Ronald Searle's 'tough' school, 'St Trinian's.' In the U.S.A. political C. for a hundred years kept pace with that of Europe, deriving from Gillray, whose influence was brought to America by Wm Charles, a Scottish immigrant. From the time of the Civil war, political satire received a tremendous impetus in the U.S.A., achieving its greatest prominence in the work of Thomas Nast; and both in caption and draughtsmanship the cartoons of such papers as *Judge* and *Life* were ahead of those of almost any other country. During the last 40 years the work of Amer. cartoonists has given rise to the outstanding popularity of the 'comic strip,' without which a newspaper is hardly complete in the U.S.A. Comic strips portray a series of episodes in the lives of imaginary but typical cartoon characters. Harry Hershfield, Reuben Goldberg, George McManus (of 'Bringing Up Father' fame), Rudolph Dirks (creator of the Katzenjammer Kids), Harold Gray, Bud Fisher (creator of Mutt and Jeff) are a few names among many artists who have achieved fame in the art of the comic strip, which also gained greatly in popularity in Great Britain during the Second World War. A modern form of the art is represented by the animal grotesques of the film by Walt Disney. See catalogues of *Political and Personal Satires* (Brit. Museum) by D. M. George; also Champfleury, *Histoire de la Caricature*; C. R. Ashbee, *Caricature*, 1928; R. Davis, *Caricature of To-day*, 1928; E. H. Gombrich and E. Kris, *Caricature*, 1940; Werner Hofmann, *Caricature*, 1957.

Caries, destruction of bone by inflammation. In its acute form it may be due to injury or infection from almost any pyogenic organism. In its chronic form it is usually tubercular in origin, and more

rarely syphilitic. It may occur in any bone, but most commonly in the spine. The affected vertebrae collapse as the bone gradually ulcerates away and a twisted and bent spine results. The 'hunchback' deformed person is not the common sight now that he was 30 years ago owing to earlier treatment of these conditions (see TUBERCULOSIS). Dental C. (see DENTISTRY), chronic decay of the teeth.

Carigara, tn on C. Bay on the coast of Leyte, Philippine Is. It is a port of call for steamers coming from Manila. Pop. 26,803.

Carignan (formerly Yvois), Fr. tn in the dept of Ardennes, on the R. Chiers. There are woollen manufs. Pop. 1700.

Carignano, It. tn, in Piedmont (q.v.), 10 m. SW. of Turin (q.v.). It gives its name to a branch of the House of Savoy (q.v.). Pop. 6800.

Carijós, one of the original tribes of Brazil. When the Portuguese colonised Brazil they received them and were not hostile in any way. Later on, however, they rose when attacked, and this led to their almost total extermination.

Carillon, set of bells, tuned to the intervals of the chromatic scale, and providing a compass of not less than 2 octaves (25 bells). They are hung rigidly in a frame and struck by clappers suspended within them, and pulled against the surface of the bells by wires and levers connected to a machine, or to a keyboard (clavier) which is played by a carillonneur. The keyboard also has foot-pedals for the larger bells, similar to an organ. In some parts of Europe C. playing has for cents. been important. There are famous C.s in the Netherlands. As a war memorial the idea of installing keyboard C.s was adopted after 1918 at Loughborough and at Wellington (New Zealand). C. music exists mostly in MS. Schott, in 1862, pub. an important selection of preludes, fugues, and minuets from the works of Matthias van den Gheyn (1721-85), which was ed. by van Elewyck in collaboration with the organist Lemmens. In more recent years, J. Denijn and J. A. F. Wagenaar wrote specially for the C. Elgar composed a special *Memorial Chime* for the opening ceremony of Loughborough C. in 1923. C. music must exhibit an intimate knowledge of a special technique. Two-part writing, with clearly defined harmonic suggestion, is regarded as the most effective. A school of C. playing was inaugurated at Malines (or Mechlin) in 1922 with Denijn as director. See also BELL and CHIME.

Carilocus, see CHARLIEU.

Carina, or Keel, term applied to the lower petals of a papilionaceous flower, e.g. pea or laburnum, which are fused together and form a boat-shaped structure.

Carinaria, genus of pelagic gastropod mollusc, is to be found in tropical seas and the Mediterranean. The shell is shining in appearance, small and conical in shape, the foot is long and the visceral sac is small. *C. mediterranea* is a common species.

Carinatae, larger of the 2 groups of

living birds, the other being the *Ratitae*, e.g. emus and ostriches. It receives its name from the fact that the sternum is always keeled except in flightless forms, e.g. dodos, but nearly all the species have well-formed wings capable of flight. See BIRD.

Carini, tn in Sicily (q.v.), overlooking the NW. coastal plain, 10 m. W. of Palermo (q.v.). It has a Gothic castle. Pop. 16,000.

Carinthia (Ger. *Kärnten*), prov. of S. Austria, bordered on the S. by Italy and Yugoslavia. In Rom. times part of the prov. of Noricum (q.v.), its inhab., the Carni, were overwhelmed by the Slavs (c. 6th cent.). Charlemagne (q.v.) annexed it to the Frankish Empire, and it finally came to the archdukes of Austria in 1335. After the First World War small portions of C. were ceded to Italy and Yugoslavia (see ST GERMAIN-EN-LAYE and TRIANON, Treaties of). The prov. is very mountainous; in the N. are the Noric Alps, and the S. is formed of the Drau Mt Chain. Grossglockner (12,460 ft) in the NW., belonging to the Hohe Tauern, is the highest peak in Austria. The R. Drau crosses the prov. E.-W., and there are nearly 200 lakes, of which the largest are Wörther, Millstätter, Ossiacher, and Weissen. The chief occupations are stock-raising, forestry, and mining (iron, lead, zinc, and coal). There are metallurgical, textile, and chemical industries, and hydro-electric installations, and there are numerous tourist resorts. The prin. tns are Klagenfurt (the cap.) and Villach (qq.v.). Area 3680 sq. m.; pop. 474,750.

Carinus, Marcus Aurelius, Rom. emperor AD 283-4, son of Carus, and Governor of W. Empire under him. He fought against Ger. tribes, then returned to Rome and luxury. On the death of C.'s brother, Numerian, Diocletian was proclaimed emperor in Moesia. C. won a battle against Diocletian on the Margus, but was afterwards killed by his own soldiers.

Carisbrooke, part of the bor. of Newport (q.v.), Isle of Wight, in Hants, England. It lies SW. of the tn centre, and was once the cap. of the Is. C. Castle, partly in ruins, is the distinguishing feature of the vil. It dates back to very early times, and was the scene of the imprisonment of Charles I for a time.

Carissa, genus of thorny shrubs of the order Apocynaceae, found in Asia, Australia, and Africa. *C. carandas*, Christ's thorn, or the carandas-tree, is used for fencing in India, and the edible fruit is pickled, preserved, or eaten raw. *C. xylocpiron*, the bitter-wood, is a native of Madagascar.

Carissimi, Giacomo (1605-74), It. musician. He was chapel master at the church of Sant' Apollinare in Rome, and is famous for his reform of the recitative, and for being practically the inventor of the cantata. His music is distinguished by its pure style and its exquisite melodies, while among his followers may be numbered such men as Bassani and Alessandro Scarlatti. He wrote a number-

of oratorios and cantatas, the most famous among the former being *The Sacrifice of Jephthah*.

Caritat, Marie Jean Antoine Nicolas, see CONDORCET, MARQUIS DE.

Carl Rosa Opera Company, formed by Carl August Nicolas Rosa (q.v.) in 1873. It became the foremost private travelling repertory opera company in the Brit. Isles.

Carle Sunday, see CARE.

Carlén, Emilie Flygare- (1807-92), Swedish novelist, b. Stroomstad. In 1827 she married Dr Flygare. She was left a widow after about 6 years, and she then began her literary career, writing *Walde-mar Klein* in 1835. Shortly after this she married Johan Gabriel O., a poet, and settled in Stockholm. Among her works, many of which have been trans. into English, are *Fosterbroderne*, 1840, *Rosen på Tistelön*, 1842, and *Pål Värning*, 1844. Most of her novels are set in the W. coast of Sweden. See A. Kjellén, *E. Flygare-Carlén*, 1932.

Carlentini, tn in Sicily (q.v.). 21 m. NW. of Syracuse (q.v.). It is named after its founder, the Emperor Charles V (q.v.). Pop. 9000.

Carleton, Will (1845-1912), Amer. poet, b. Hudson, Michigan, son of a farmer. He became a journalist, and in 1871 wrote 'Betsy and I are Out,' which was pub. along with other poems in *Farm Ballads*, 1873. Three other vols. of country verses followed, and after moving to Boston he wrote *City Ballads*, 1885, and other collections inspired by town life.

Carleton, William (1794-1869), novelist, b. Prillisk, co. Tyrone. Settling in Dublin, he wrote short stories which were collected in *Traits and Stories of the Irish Peasantry*, of which there were 2 series, in 1830 and 1832. Of his longer novels the best is *Fardorougha the Miser*, 1837. See D. J. O'Donoghue, *The Autobiography and Life of Carleton*, 1896.

Carli, or Carli-Rubbi, Giovanni Rinaldo, Count (1720-95), It. political economist and antiquary. The Senate of Venice made him prof. of astronomy and navigation, 1744-50. He persuaded Joseph II to abolish the Inquisition. His most famous work is *Delle monete e dell' istituzione delle zecche d'Italia*, on the coins of Italy (1754-60).

Carlile, Richard (1790-1843), free-thinker and radical, a reformer, b. Ashburton, Devon, the son of a shoemaker. He was educ. at the vil. school, and became a journeyman tinman in London. There he became an extreme radical, and underwent sev. terms of imprisonment for publishing various suppressed books, including those of Thomas Paine, and also for his work in numerous pamphlets and newspapers which were regarded as seditious. C.'s activities did a great deal towards securing the freedom of the press, and though he himself was imprisoned, his pubs. were never suppressed. Cobbett and others, however, deprecated the idea of establishing the theological or even the medical freedom of the press as mischievous. See G. A. Aldred, *Richard Carlile, Agitator*, 1923.

Carlile Wilson (1847-1942), founder of the Church Army (q.v.), b. Brixton of Scottish descent on his father's side; educ. at the London College of Divinity. In early life he entered business, travelled much on the Continent, and studied music. He was influenced by the Moody and Sankey mission of 1875, and in 1880 was ordained in the Church of England. Two years later, while working in the slums of Westminster, he founded the Westminster Mission, from which the Church Army developed. A breakdown in health caused him to accept a living at Netteswell, Essex, in 1891, but a year later he became rector of St Mary-at-Hill, London, where he remained until his retirement in 1926. His evangelistic and social work grew in value, and in 1896 the Church Army mission was carried to prisons and reformatories. In 1906 C. became prebendary of St Paul's Cathedral, and shortly after travelled on the Continent to study labour conditions, publishing on his return *The Continental Outcast*. After the First World War, during which the Church Army did notable work, the movement spread overseas, taking root particularly in the U.S.A., which C. visited in 1926. Awarded C.H., 1926; Hon. D.D., Oxford Univ., 1915, and Toronto Univ., 1926. C. had outstanding gifts of leadership and organisation, and as founder and hon. chief secretary of the Church Army his active missionary work did not cease until his death. Pub. *The Church and Conversion*, 1882, *Spiritual Difficulties*, 1885, *Baptism of Fire*, 1907. See Sidney Dark, *Wilson Carlile*, 1944.

Carlina, genus of Compositae, spreads over Europe to the middle of Asia. *C. vulgaris*, the carline thistle, is a native of Britain; it has the curious habit of opening widely in dry weather, and in wet seasons the white inner leaves of the surrounding bracts cover over the flower-heads, leaving the prickly outer bracts exposed to the rain. *C. acutis*, the weather thistle, is abundant in the Alps and has the same characteristic action. The purgative obtained from the roots is used in veterinary practice.

Carling, Sir John (1828-1911), Canadian statesman and capitalist, b. London, Ontario. His father, Thomas C., was a native of Yorks, and left England for Canada in 1818. In 1862 he held the post of receiver-general of Canada, and later became commissioner of agriculture and public works. He was afterwards minister of agriculture, and in 1882 postmaster-general. He also founded the Agric. College in Ontario. K.C.M.G. in 1893.

Carlingford, seaport and mkt tn of the co. or Louth, in the prov. of Leinster, Rep. of Ireland. It stands amid fine mt scenery on the bay, or lough, of the same name, and has many historic associations. King John's Castle and Taaffe's Castle are both of interest, and there are the ruins of a 14th-cent. Dominican priory. Pop. 600.

Carlingford Lough, part of the Irish Sea at the mouth of the R. Newry,

between cos. Louth and Down. It is 10 m. long and 2 m. wide, and can accommodate the largest ships.

Carlisle, Sir Anthony (1768-1840), surgeon, b. Stillington, Co. Durham, first apprenticed to practitioners in York and Durham, then studied under John and Wm Hunter in London. Member of College of Surgeons, and surgeon-extraordinary to the prince regent (George IV); 1793-1840, surgeon to Westminster Hospital; F.R.S., 1800, contributing various treatises on physiology; 1808-25, lectured on anatomy at Royal Academy; knighted, 1821; became president of the College of Surgeons, 1829. C. introduced the thin-bladed, straight-edged amputating knife. His writings were largely on anatomy; also on artistic and scientific subjects. One pamphlet, written in collaboration with W. Nicholson in 1801, was on galvanic electricity. See T. J. Pettigrew, *Medical Portrait Gallery*, ii, 1840; J. F. Clarke, *Autobiographical Recollections of the Medical Profession*, 1874.

Carlisle, George William Frederick Howard, 7th Earl of (1802-64), Eng. statesman, educ. at Eton and Christ Church, Oxford. In 1826 he went to Russia, and in the same year was elected to Parliament. From 1835 to 1841 he was chief secretary for Ireland, and in 1850 was made chancellor of the Duchy of Lancaster. In 1855 Lord Palmerston appointed him lord-lieutenant of Ireland, an office he held till 1858 and from 1859 to 1864. He had succeeded to the earldom in 1848.

Carlisle (Rom. *Luguvallium*, Brit. *Caer Luel*), parl., city, and (1914) co. bor., cap. of Cumberland, England, stands on a fertile tract of land about 10 m. from the Scottish border on gently rising ground surrounded on 3 sides by the Rs. Eden, Caldew, and Petteril. It is on the NW. line of communication from England to Scotland by road and also an important railway junction with many lines converging into it. It is also the centre of an efficient local and long-distance bus service. The city is just S. of Hadrian's Wall from the Tyne to the Solway Firth; it was once a Rom. civil settlement—the great cavalry fort of *Petriana* being half a m. distant on the N. side of the riv. During the Dan. invasions it was attacked and burnt and lay in ashes until the coming of the Normans. Wm Rufus realised the importance of a place lying so near to the N. frontier of his kingdom and gave orders for its rebuilding. He also caused a keep and walled enclosure to be erected (1092). By 1170 the castle, further enlarged and strengthened, was playing its part both in the continuous border warfare, that only ceased with the Union, and also in greater national struggles—particularly in the Civil war when it was besieged and captured by the parl. forces under Gen. Lesley. Edward I held his last Parliament in the castle and Mary Queen of Scots was kept here for some time, virtually a prisoner, by Elizabeth. In 1745 it surrendered to Prince Charles Edward, but was quickly

retaken by the Duke of Cumberland. At the beginning of the 19th cent. great portions of the castle were pulled down (amongst them the banqueting hall where Edward I had held his Parliaments). As it now stands it is in the care of H.M. Office of Works and is used as barracks and depot for troops of the Border Regiment. It also serves as the museum for the Border Regiment—the old 34th (Cumberland) and 55th (Westmorland) Regiments. The bishop's see was founded by Henry I in 1133 and included the cos. of Cumberland, Westmorland, and regions of Lancs, lying N. of Morecambe Bay. The cathedral, originally the church of an Augustinian priory, built between the years 1092 and 1419, was once a noble edifice, cruciform in shape, but since the time of the Civil war, when the greater part of its Norman nave was pulled down and the stones used for military purposes, it has had the truncated appearance it now presents. It has a beautiful Early Eng. choir whose clustered columns have their capitals decorated with carved figures and flowers representing the occupations of the months of the year. The choir stalls with their carved misericords are surmounted by graceful tabernacle work. The E. window, measuring 60 ft by 30 ft and having 9 lights filled in with beautiful tracery, is considered to be the finest Decorated window in the kingdom.

The chief streets lead from the marketplace in front of the town hall. There are sev. interesting public buildings and institutions, including the old Guildhall, a well-equipped modern public library, and also a splendid museum and art gallery—the museum being rich in Rom. remains and having one of the best natural hist. collections to be found in the provs. C. grammar school was founded in 1170. The city is engaged in a great variety of industries, of which the chief are the manufacturing of textiles—calico, cretonnes, muslins, voiles, artificial silks, and Cumberland tweeds—also of carpets, hats, biscuits, sweets, tin boxes, and cranes. The centre of a large agric. area, it has also important live-stock markets. By the Licensing Act of 1921 the wholesale and retail licensed trade of Carlisle was transferred to the home secretary. With the object of supplying all reasonable demands, whilst at the same time taking all possible care to avoid excess, the number of licensed houses was reduced and the others greatly improved—food being provided and served in rooms set apart for the purpose. The inns are in the care of managers with a district manager as head. The results of the scheme as far as C. is concerned are good. The pop. of the city and co. bor. in 1951 was 67,894. It sends 1 member to Parliament.

Carlisle, bor. in Cumberland co., Pennsylvania, U.S.A., about 19 m. from Harrisburg. Dickinson College was founded here in 1783, and there is also a school for Amer. Indians. Pop. 16,812.

Carlists, name given to the followers

of Don Carlos de Bourbon (1788-1855) and his successors, who in turn laid claim to the Sp. throne. Don Carlos was the brother of Ferdinand VII (1784-1833). In 1830 Ferdinand was persuaded by his queen to alter the existing Salic law and appoint his infant daughter as his successor, to the exclusion of Don Carlos, Carlos refusing to acknowledge the legality of this action. On Ferdinand's death intermittent civil war broke out, the constitutional party supporting the infant queen, the absolutists (and the Basques) Don Carlos. In 1840 Don Carlos's defeat was obvious. He *d.* in 1855; his son Carlos succeeded to his claim, but was expelled from France, and took no part in the abortive Carlist risings of 1846 and 1848. In 1860 he and his brother Ferdinand landed at Catalonia, but were captured and only saved their lives by a humiliating surrender of their pretensions. Their brother John now put forward his candidature, afterwards resigning it to his son, Don Carlos VII, who raised a Carlist war in 1872, and for a time had some success, but was finally driven out of the country in 1876. His son Don Jaime was subsequently recognised as the legitimate pretender, but the recognition had no practical results. There was a slight resurgence of Carlism during the Sp. Civil War, owing to the somewhat unexpected adherence of the Basque Nationalist and Catholic party to the Rep. Gov., but it is unlikely that any Carlist claimant would now find acceptance in Spain.

Carloforte, see SAN PIETRO.

Carloman: 1. Son of Charles Martel and brother of Pepin. He succeeded his father in 741, and, with Pepin, repelled the Ger. invaders in 743. C. advanced into Saxony and captured the Duke of Saxony. Later he entered a Benedictine monastery.

2. Younger brother of Charlemagne, with whom he unsuccessfully contested the Frankish kingdom. He *d.* in 771.

3. Second son of Louis II, whom he succeeded in 879. Proclaimed sole King of France on the death of his brother, Louis III. Killed while boar-hunting, 884.

Carlos I (1863-1908), King of Portugal, succeeded his father Luiz I in 1889. He was a lover of peace, and encouraged literature (he was the author of the best trans. of Shakespeare in the Portuguese language), science, and art, but the latter part of his reign was disastrous, owing to the policy of his chief minister, Senhor Franco. The king and his eldest son were assassinated in Lisbon, 1 Feb. 1908.

Carlos, Don (1545-68), Sp. prince, son of Philip II of Spain, showed signs of mental instability in his childhood. After an accident in 1562 the prince's derangement became more violent, and his vicious life caused much scandal. In 1567 he was put under restraint and *d.* in somewhat suspicious circumstances 6 months later. Sev. writers, including Schiller (q.v.) and Alfieri, have founded dramas upon the prince's mysterious death.

Carloti, La, Sp. tn in the prov. of

Córdoba, with manufs. of linen. Pop. 8900.

Carlovingians, or **Carolingians**, Fr. dynasty, named after its greatest monarch Carolus Magnus (Charlemagne, q.v.). About the year 623 Clotaire II, one of the Merovingian kings, gave his son Dagobert the kingdom of Austrasia (roughly speaking Lorraine and Franconia), with Pepin as mayor of the palace, whose grandson Pepin d'Héristal made himself master of both Austrasia and Neustria in 687, though he did not assume the royal title. His son, Charles Martel (q.v.), seized the reins of gov. on his father's death, and became renowned as a warrior and administrator, but still contented himself with being mayor of the palace to the nominal king. His son, Pepin le Bref, deposed King Childeric III and became king, reigning from 751 to 768. He was succeeded by his son, Charlemagne, one of the greatest monarchs in European hist., both as conqueror and ruler. Extending his kingdom across the Pyrenees to the Ebro, eastward to the Elbe, the Bohemian Mts, and even to Croatia and Dalmatia, and southward to Naples, he was crowned (800) by Pope Leo III as head of the Holy Rom. Empire. Charlemagne's son, Louis le Debonnaire, shared his domains between his sons, Charles II taking France (840). Forty years later Charles III reunited the empire but was deposed by Odo of Paris, and though there were other Carlovingian monarchs their authority was little more than nominal. The dynasty in France ended with Louis V, who was succeeded by Hugh Capet (987), though in Germany Carlovingians ruled as kings until 911.

Carlow: 1. Co. of the Rep. of Ireland in the prov. of Leinster, with an area of some 349 sq. m., mostly arable. It is bordered by the Blackstairs Mts in the SE. (Mt Leinster, 2610 ft), the rest of the co. being level or undulating. Chief tns are C., Tullow, and Muine Bheag. C., with Kilkenny, returns 5 members to the Dail. Pop. 34,000.

2. Municipal bor., chief tn of above co., on R. Barrow, about 50 m. from Dublin. It is the seat of the Catholic Bishop of Kildare and Leighlin. Ruins of an Anglo-Norman castle dating from 1180 can be traced. There are flour mills, and C. forms the centre of a large sugar-beet industry; granite rock is found near by. St Patrick's College was founded in 1795; in 1798 Irish rebels attacked the tn, but were repulsed. Pop. 7500. See J. Ryan, *History and Antiquities of Co. Carlow*, 1833.

Carloway, Doon of, remains of a circular tower at C., a tn of Ross-shire, on the is. of Lewis in Scotland.

Carlowitz, see SREMSKI KARLOVCI.

Carlsbad, see KARLOVY VARY.

Carlshamn, see KARLSHAMN.

Carlskrona, or **Karlskrona**, fortified seaport and naval station of Sweden, on 5 rocky is. in the Baltic, which are connected together and with the mainland by 14 bridges. It was founded in 1680 by Charles XI. It has a magnificent harbour with a naval arsenal and dockyard. Pop. 33,552.

Carlsruhe, see KARLSRUHE.

Carlstad, *see* KARLSTAD.

Carlstadt, Andreas Rudolf Bodensteln af (1480-1541), Ger. theologian, b. Karlstad; prof. of Wittenberg Univ. While studying theology in Rome he became imbued with the same doctrines as Luther. His views, however, were more advanced than the latter's, and the two found themselves in opposition, as C. denounced the practices of the Church without limit. Accused of taking part in the peasants' revolt, he fled to Switzerland about 1525.

Carlton, tn 3 m. from Nottingham, England, with a pop. of 34,360 principally engaged in mining and railway industries.

Carlton Club, founded by the Duke of Wellington in 1832, and famous as the stronghold of Conservatism. The original building, 94 Pall Mall, was designed by Sir Robert Smirke, but was destroyed by enemy action in 1940, and the club is now housed at 69 St James's Street. In 1922 the club was the scene of an historic meeting of the leading Conservative members of Parliament and others, when one section, under the lead of Austen Chamberlain, decided to continue to support Lloyd George and the Liberal wing of the Coalition party, and another section, comprising the larger body, broke away and decided to throw in their fortunes with Bonar Law, who became Prime Minister. *See* CLUBS.

Carlruke, tn of Lanarkshire, Scotland, about 5 m. NW. of Lanark. The basic industries are agriculture and horticulture (particularly soft fruits and flowers), though formerly the area was a centre for coal and ironstone mining. Pop. (tn) 8000; (par.) 11,400.

Carlyle, Alexander (1722-1805), Scottish minister. He took his degree at Edinburgh Univ. and afterwards went to the univs. of Glasgow and Leyden. In 1748 he became minister of Inveresk, a position which he held for the rest of his life. He adopted the views of the writer John Home, one of his friends (and was censured for attending Home's *Douglas*, 1757), and favoured the moderate party in the Church. He numbered among his friends Smith and Hume (qq.v.). He was nicknamed 'Jupiter' C., on account of his fine presence and bearing. Moderator of the General Assembly. His *Autobiography* was pub. in 1860.

Carlyle, Alexander James (1861-1943), Scottish historian, educ. at Glasgow and Oxford Univs. He was curate of St Stephen's, Westminster, 1888. Secretary to S.P.C.K., 1890-1; rector of St Martin's and All Saints', 1895; became chaplain and lecturer in political science and economics at Univ. College, Oxford. In Aug. 1930 he was made canon of Worcester. His prin. work (written in collaboration with his brother, Sir R. W. C.) is *History of Medieval Political Theory in the West* (6 vols.) 1922-30.

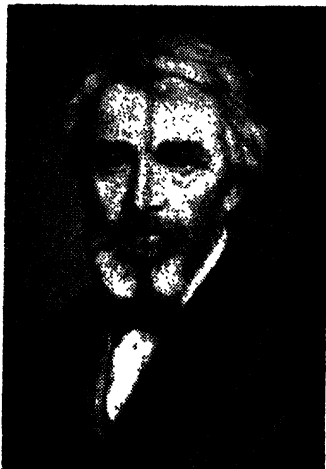
Carlyle, Jane Baillie Welsh (1801-66), wife of Thomas C. (q.v.), b. near Haddington, the daughter of Dr John Welsh; among her ancestors were John Knox and Sir Wm Wallace. As a girl she was a pupil of Edward Irving (q.v.), who in 1821 introduced her to C.; they became

great friends, and their friendship ripened into a stronger feeling. He was, however, in poor circumstances; Mrs Welsh also discouraged his wooing, and a formal engagement was long postponed, but the wedding finally took place in Oct. 1826. For years C.'s income was small, and his wife, who was not used to hardships of which he made light, suffered in health and spirits. After sev. changes of residence, between Edinburgh and Craigenputtock, they removed in 1834 to London, and settled down in Cheyne Row, Chelsea. All household anxieties fell on her, and she suffered much from loneliness while he was entirely engrossed in his books. He failed to notice this, and though kind in great things, often vexed her in little ones. They were warmly attached to each other, but both too nervous and highly strung for a peaceful union. In 1863 Mrs C. was hurt in a cab accident, and the shock brought on serious results. Her husband, greatly troubled, did all he could to give her every comfort she required, but in 1866 she d. suddenly in her own carriage, and the shock completely overpowered him. *See* *Letters and Memorials of Jane Welsh Carlyle*, prepared for pub. by Thomas C., and ed. by J. A. Froude (3 vols.), 1883; *New Letters and Memorials*, ed. by Alexander C. (2 vols.), 1903; *Letters to her Family*, ed. by L. Huxley, 1924; *Letters to Joseph Newberg, 1848-62*, ed. by T. Scudder, 1931; also life by T. Scudder, 1939.

Carlyle, John Aitken (1801-79), doctor and translator, younger brother of Thomas C., b. Ecclefechan. After studying medicine at Edinburgh and in Germany, he tried to establish a practice in London, but failed; he then obtained a post as private physician first to the Countess of Clare and afterwards to the Duke of Buccleuch. In 1843, having saved a moderate competency, he settled near his brother, and devoted himself to literature. He began a prose trans. of Dante's *Divina Commedia*, but only completed the *Inferno*, his rendering of which (pub. 1849) was highly praised; he also ed. Dr Irving's *History of Scottish Poetry*, 1861.

Carlyle, Thomas (1795-1881), historian and man of letters, second son of James C. by his second wife, b. Ecclefechan, Dumfriesshire. After acquiring the rudiments of education from his parents, he went for a time to the par. school, and then, in 1805, to the Annan Academy, where for the first 2 years at least he was profoundly unhappy, finding his only comfort in omnivorous reading. He matriculated at Edinburgh Univ. in 1809, and there he remained until 1813, when he came down without taking a degree. It was at this time that he began to prepare himself to take orders in the Church of Scotland, supporting himself the while by teaching. In 1814 he obtained the post of mathematical master at Annan Academy at a salary of about £60 and during the 2 years he was there he decided that he had not a call to the ministry. From Annan he went to Kirkcaldy to take up a somewhat better paid position as assistant master at

the par. school. There he became intimate with Edward Irving (q.v.), who was at this time head of a school in the same town, and fell in love with one of Irving's pupils, Mary Gordon, the 'Blumine' of *Sartor Resartus*. The friendship endured, but the love affair was nipped in the bud. By Nov. 1818, C. had come to the conclusion that schoolmastering was the most detestable occupation in the world, and, having saved £70, he threw up his post, and went with Irving to Edinburgh. It was his intention to become a lawyer, but he soon tired of the study of the law, and abandoned all desire to enter that



E.N.A.

THOMAS CARLYLE

profession. He contrived to pay his way by giving private lessons. Here he made his first plunge into authorship, writing articles for the *Edinburgh Encyclopaedia*. Irving in 1821 introduced C. to Jane Baillie Welsh (see CARLYLE, J. B. W.), with whom Irving was in love, and whom he desired to marry if he could obtain his release from his engagement contracted earlier with a Miss Martin. C. was kept in ignorance of the state of affairs, and he too fell in love with the girl. C. in 1822 became tutor to Charles and Arthur Bulwer, both of whom acquired some distinction in the world, at what seemed to him the splendid salary of £200 a year. C. had soaked himself in Ger. literature for some years past, and these studies dictated his earlier works, *The Life of Schiller*, which, after appearing serially in the *London Magazine* in 1823 and 1824, was pub. in 1825; and *Wilhelm Meister's Apprenticeship*, a trans. of Goethe's novel, 1824. With Irving he had visited London in 1824, and made some acquaintances in literary circles; and after his return he persuaded Miss Welsh to become his wife.

They were married on 17 Oct. 1826, and settled in Edinburgh, furnishing on the proceeds of *German Romance*, comprising trans. from Musaeus, La Motte Fouqué, Tieck, Hoffman, Richter, and Goethe. He now depended entirely for his livelihood on his pen, and he was so fortunate as to secure admittance in 1827 to the *Edinburgh Review*, his first contribution being an essay on Jean Paul Richter. Soon he was in full work, writing for the prin. periodicals, the *Foreign Quarterly*, the *Westminster Review*, and *Fraser's Magazine*. It was in the last-named that in 1833-4 *Sartor Resartus* appeared, but it was so little popular that it was not until 4 years later he could find anyone to bring it out in book form. In the summer of 1834 he took up his residence at No. 24 Cheyne Row, Chelsea, London, and there he wrote *The French Revolution*, which appeared in 1837. He eked out a meagre income by delivering courses of lectures on Ger. literature, 'Heroes, Hero-worship, and the Heroic in History,' and other subjects, but he hated the work, and was relieved when Mrs C. came into her mother's small fortune in 1842, and he could devote himself exclusively to his books. He pub. *Past and Present* in 1843, and 2 years later gave to the world the epoch-making *Cromwell's Letters and Speeches*. *Latter-day Pamphlets* was issued in 1850, and the *Life of John Stirling* in the following year. He now devoted the greater part of his time to the composition of *Frederick the Great*, the first vol. of which appeared in 1858, and the last in 1865. Long before this he had been recognised as one of the leading men of letters in the kingdom, and a proof of the high esteem in which he was held was forthcoming in 1865, when he was nominated against Disraeli as a candidate for the office of lord rector of Edinburgh Univ., and was elected by 657 to 310 votes.

The death of his wife from heart disease, while driving in Hyde Park, in April 1866, caused him much grief, and the rest of his life was embittered by the knowledge, which came to him too late, that he had, by his perverse ways and cross-grained temper, caused her great distress. He ed. her *Letters and Memorials*, but these were not pub. until 2 years after his death. He was much pleased when in 1874 the Prussian Order of Merit was bestowed on him, a compliment singularly appropriate, since Frederick the Great founded the order. In the same year Disraeli offered him the choice of a baronetcy or the Grand Cross of the Bath; this touched him greatly, for, as he said, Disraeli was the only man of whom he had always spoken with contempt. The letters exchanged on this occasion were worthy of the writers. C. refused both honours, but he thought more kindly of the statesman ever after. He d. on 4 Feb., and a burial service at Westminster Abbey was offered, but, in accordance with his wish, his remains were interred at Ecclefechan. C. won his place in the world of letters with difficulty. *Sartor Resartus*, his first important work, the fantastic gospel of

clothes, set more people against him at the time of its pub. than it is easy now to conceive. *The French Revolution*, too, had its detractors, the true Carlylean style, in spite of its brilliance, annoying the critics. Yet the style was the man. No man could acquire such a style, it was born with him, and his imitators, who at one time were numerous, have paid the penalty of oblivion for their attempts to ape the master. 'His faults of style,' said that discerning critic, Leslie Stephen, 'are the result of the perpetual straining for emphasis of which he was conscious, and which must be attributed to an excessive nervous irritability seeking relief in strong language, as well as to a superabundant intellectual vitality.' C. saw things so vividly that he was compelled to try to portray them vividly, and the conventional styles giving him no outlet, he made a style for himself. *The French Revolution* marked him out as a writer of importance, and this impression was confirmed by his *Cromwell*, in which he gave a new, and probably truer, conception of the Protector's character. The 14 years' labour that it took to produce *Frederick the Great* produced a work second only, if indeed second, to the *French Revolution*. As a picturesque historian C. has no equal. He had knowledge, as a matter of course; he had virility, and he had the power to convey his thoughts in a fashion so vivid that to read him once is never to forget him.

It has been said that all C.'s powers of persuasion as a religious teacher were devoted to that paganism of Christianity which was the cultural aim of Nazism, coupled with inculcation of Carlylean hero-worship, 'burning and boundless,' for a leader. Certainly violence was irresistibly attractive to him. He praised it whether it showed itself in the excesses of a mob, in Cromwell's Irish massacres, in Frederick's ruthless meanness, or in events in his own lifetime. As the critic Desmond MacCarthy observes, 'Though a tender-hearted man himself, there was a disagreeable amount of aesthetic cruelty in his make-up, and the gleams of beauty and of fantastic humour, cosmic and human, which give his writings their value, are combined with much insincere rhetoric.' His guiding principle in the interpretation of of hist. was: 'Right must triumph; therefore might must be right. He tried to read that into hist. and his own faith depended on success. He was greatest as an historian, and *The French Revolution* was, by universal consent, his greatest hist. To quote Prof. G. M. Trevelyan, 'Its humour, its pathos, its trenchancy, its dramatic power and insight into human nature, make it one of the greatest, though certainly the strangest of histories. It lacks very much that later histories of the revolution have got. But it has got those qualities they all lack.' The prin. authority for C.'s life is his *Reminiscences*, ed. by J. A. Froude (1881) and in a better ed. by C. E. Norton (1887), who also ed. the *Correspondence* with Emerson (1883), with Goethe (1887), and *Letters*

of Thomas Carlyle, 1826-36 (1888). Froude's *Life* (4 vols.), 1882-4 is not wholly reliable. See also R. Garnett, *Life of Thomas Carlyle* (with bibliography), 1887; A. Carlyle (ed.), *Love Letters of Thomas Carlyle and Jane Welsh*, 1909; the monumental *Life of Carlyle* by D. A. Wilson (6 vols.), 1923-34; C. F. Harrod, *Carlyle and German Thought*, 1819-32, 1934; J. Symonds, *Thomas Carlyle*, 1952.

Carlyle, Thomas (1803-55), jurist, b. Kirkcudbrightshire, was called to the Scottish Bar in 1824, and acted as defendant's counsel in the Campbell heresy trial, 1831. Joining the Irvingite church in 1832, he was in 1838 appointed 'Apostle' to N. Germany, and during his residence there wrote his *Moral Phenomena of Germany*.

Carmagnola, Francesco Bussone, Count of (1390-1432), It. *condottiere*, b. at Carmagnola in Piedmont. He entered the service of Filippo, Duke of Milan, who raised him to the rank of count and made him governor of Genoa. His success in the field roused the duke's jealousy, and before long there was a coolness between them, ending in a definite rupture. C., in revenge, offered his services to the Venetians (1425). He defeated the duke's army at Macclodio, and took Brescia from him. After this peace was made, lasting for 1 year. On the renewal of hostilities C. again took command, but he was also in communication with the duke, who tried to seduce him by bribes. His indifference resulted in reverse and failure, and the senate, tired of his duplicity, enticed him to Venice, where he was brought before the Committee of Ten, tried, tortured to extort a confession of guilt, and beheaded.

Carmagnola, It. tn. in Piedmont (q.v.), on the Po (q.v.). It has an anc. printing industry, and is in a dist. producing mint and hemp. Pop. 12,000.

Carmagnole (from Carmagnola, N. Italy): 1. Peasant costume of Piedmont and the Midi, carried by S. revolutionaries to Paris in 1793.

2. Wild song and dance which went with the costume, and were very popular with the revolutionaries during the Terror in Paris. The refrain of each verse is:

Vive le son, vive le son,
Dansons la Carmagnole, vive le son du canon!

Carman, William Bliss (1861-1929), Canadian poet, b. Fredericton, New Brunswick. He was related on his mother's side to R. W. Emerson. Educ. at the collegiate school of Fredericton, and the univ. of New Brunswick, Edinburgh, and Harvard, he became a journalist, and from 1890 to 1892 was office editor of the *New York Independent*. His chief poetical pubs. were *Low Tide on Grand Pré*, the earliest and perhaps the best, 1893; *Ballads of Lost Haven*, 1897; *Songs from Vagabondia* (with Richard Hovey), 3 collections, 1894, 1896, 1900; *Behind the Arras*, 1905; *A Winter's Holiday*, 1899; *Christmas Eve at St*

Kavin's, 1901; *Ballads and Lyrics*, 1902; *The Word at St Kavin's*, 1903; *Songs from a Northern Garden*, 1905; *The Rough Rider*, 1909; *April Airs*, 1916; *Later Poems*, 1921; *Far Horizons*, 1926; *Wild Garden*, 1929. In a prose work, *The Kinship of Nature*, 1904, he developed his philosophy of nature-worship. In April 1929 the Royal Society of Canada awarded him the Lorne Pierce medal for contributions to Canadian literature. See J. Cappon, *Bliss Carman and the Literary Currents and Influences of his Time*, 1930; and studies by O. Shephard, 1923, and M. Miller, 1935.

'*Carmania*,' steel turbine steamer, triple screw, owned by the Cunard line. It was built by J. Brown & Co. Ltd. of Glasgow, in 1905, and launched at Clydebank. Length 650 ft, breadth 72 ft, speed 20 knots. As an armed merchant ship, it was severely damaged in action with the Ger. armed merchant ship *Cap Trafalgar* in the S. Atlantic in Sept. 1914, when the Ger. ship was sunk. After the war it was refitted and operated in the Liverpool-New York and London-Boston-New York service until 1931. It was sold to ship-breakers in 1932.

Carmarthen, co. tn of Carmarthenshire, Wales, on the R. Towy, 8 m. N. of Kidwelly. Formerly the Rom. *Maridunum*, the tn is largely modern, with remains of the Norman castle. It is the only Welsh tn which possesses a state sword, carried before the mayor on all civic occasions. Once it was the prin. centre of the Welsh wool trade. Made a parl. bor. in the 16th cent., C. now gives its name to one of the 2 parl. areas into which Carmarthenshire is divided. Pop. 12,120.

Carmarthen Bay, large opening on the S. coast of Wales; chief tns Tenby (Pembrokeshire) and Llanelly. See also PEN-DINE.

Carmarthenshire, co. of S. Wales, bounded E. by Brecon and Glamorgan, W. by Pembroke, N. by Cardigan, and S. by the Bristol Channel. The co. has Brit. and Rom. remains, and Carmarthen, the co. tn, was formerly the Rom. *Maridunum*. There are numerous grassy hills, mostly under 1000 ft; within the Brecon Beacons National Park on the E. border of the co. Carmarthen Van, in the Black Mts, rises to 2632 ft; in the N. is Mynydd Mallaen (1430 ft). The chief rvs. are the Towy, Taf, and Teifi; along the coast are extensive sands and marshes. The valleys are fertile, and the hillsides afford good pasturage. Dairy-farming, stock-raising, and some woollen milling are carried on, while coal-mining, iron-founding, and smelting are the industries of the SE., Llanelly being a centre for tinplate and steel manufs. C. is divided into 2 parl. divs., Carmarthen and Llanelly, each returning 1 member. Area 918 sq. m.; pop. 171,100.

Carmathians, see KARMATHIANS.

Carmaux, Fr. tn in the dept. of Tarn, on the Cérrou. It is in a coal-mining dist., and has glass and brick works. Pop. 11,200.

Carmel, Mount, range of mts in Israel 18 m. long extending from the plain of

Esdraelon in a NW. direction through the plains of Sharon to the bay of Acre, where it terminates in the only promontory on the Palestine coast. The highest point is 1810 ft. It is very fertile and beautiful, and hares, partridge, quail, woodcock, and jackals are found. El-Mahragah ('the place of burning'), a cliff 1700 ft above sea level, is the reputed scene of Elijah's sacrifice, and close by is the cave in which he is said to have lived. The Carmelite Order was founded here, 1156. Towards the N. end are sev. hotels and pensions, and, within recent years, it has become a popular residential area for the inhab. of Haifa and for summer visitors.

Carmelites, Order of, or Friars of our Lady of Mount Carmel, commonly called in England White Friars, on account of their grey scapulary, was founded in 1156 by an It. crusader, Berthold, who estab. a hermitage on Mt Carmel with some few companions. It was believed by many, however, that a succession of anchorites had occupied this spot from the time of Elias till that of Christ, and that, its members being then converted, the community had continued without a break. The controversy on this question reached its height in the 17th cent., and was only stopped by a papal edict in 1698. In 1238 the C. were driven out of Palestine by the Saracens, and settled in Cyprus, then spreading throughout Europe. Their rule was modified to suit the W. climate, and the C. were in 1247 changed by Pope Innocent IV from hermits into mendicant friars. In England they flourished greatly, and possessed over 30 houses at the dissolution of the monasteries. Nuns in the Low Countries began to be affiliated to the order in 1452, whence they spread to France, Italy, and Spain. In 1562 St Teresa (q.v.) of Avila undertook to restore the Sp. nunneries to their primitive austerity. This rule was taken up by the men and resulted in the formation of a new order of Discalced or Barefooted C., which prospered far more than the old order. See A. de St Marie, *L'Ordre de Notre-Dame du Carmel*, 1910.

Carmen, port of Campeche state, Mexico, situated on the is. of C., and possessing a good harbour. There are exports of chicile and timber. Pop. 7700.

Carmen Sylva, pen-name of Elizabeth (q.v.), Queen of Rumania.

Carmichael, James Wilson (1800-68), painter, b. Newcastle upon Tyne. He was chiefly known for his pictures of marine subjects: wrote 2 works of some value, *The Art of Marine Painting in Water Colours*, 1859, and *The Art of Marine Painting in Oil Colours*, 1864. His pictures were exhibited at the Royal Academy and elsewhere, his first appearance being in 1838. He painted in London from 1845 to 1862, when he went to Scarborough, where he d.

Carmignano, It. tn, in Tuscany (q.v.), 13 m. NW. of Florence (q.v.). Hats are manuf., and there is a trade in agric. produce and wine. Pop. 13,000.

Carmina Burana, collection of songs,

mostly in Latin, but some in German written by Goliards or wandering scholars of the 12th and 13th cents. These men were clerks, and the songs have generally the form of hymns. They vary greatly in character, some being lofty in tone, others worldly, satirical, and even distinctly immoral. The MS. is now at Munich, but was once kept at the abbey of Benediktbeuren in Bavaria, whence the songs derive their name. See ed. by A. Hilka and O. Schumann, 1930, and Eng. trans. of some of the poems in Helen Waddell's *The Wandering Scholars*, 1927.

Carmunnock, see CAMBUSLANG.
Carn, see BARROWS and CAIRN.
Carn Mòr Dearg (4012 ft), mt of Inverness-shire, Scotland, to the NE. of Ben Nevis, with which it is connected by a narrow *arête*.

Carnac, vil. in the dept of Morbihan, France. It is famous on account of the great megalithic monuments in the neighbourhood. Long avenues, consisting of thousands of blocks of rugged grey granite, extend over 1½ m. of heath. The blocks are in the form of obelisks with the apex reversed; none are more than 18 ft high. These menhirs, or



D. McLeish

THE MENHIRS OF CARNAC

Carminatives, remedial agents which relieve flatulence, colic, etc. The ordinary condiments, as pepper, mustard, ginger, cinnamon, cloves, nutmeg, peppermint, may be used as C. They are also used in conjunction with purgatives to prevent painful griping and as gentle tonics to stimulate digestion.

Carmine, red colouring matter obtained from the cochineal insect. It was discovered in 1756 by a Franciscan friar at Pisa, while conducting experiments in medicine. In manufacturing C. the cochineal is exhausted with boiling water, and the colouring matter precipitated by the addition of acid or acid salt. See DYE.

Carmo, see CARMONA.

Carmona (Rom. Carmo), Sp. tn in the prov. of Sevilla, with Rom. and Moorish remains. There is a large Rom. necropolis near by. Woollens, leather, and earthenware are manuf., and there is a trade in wine, oil, and grain. Pop. 30,000.

standing stones, are in 11 parallel rows. Here and there the rows are irregular, the gaps being accounted for by the houses in the neighbourhood, for which the peasant builders have utilised this conveniently accessible stone. There are various groups of menhirs round C., situated at Kermario (place of the dead), Kerlescan (place of burning), Erdoven, and Saint-Barbe. The object and origin of these stones are uncertain. Rom. remains were found about 1½ m. away from C. when the Bossenno, another group of mounds, was explored by the Scottish antiquary, James Miln, in 1874. Pop. 3800. See J. Miln, *Excavations at Carnac*, 1881; Z. Le Rouzic, *The Megalithic Monuments of Carnac and Locmariaquer*, 1908.

Carnahuba, Carnauba, Carnuba, *Copernicia cerifera*, Brazilian Wax Palm, from the leaves of which the wax of commerce used in candles, polishes, etc., is gathered. The wood is extremely hard.

Carnarvon, George Edward Stanhope Molyneux Herbert, 5th Earl of (1866-1923), Egyptologist, b. Highclere, Berks, eldest son of Henry Howard Molyneux, 4th earl. Educ. at Eton and at Trinity College, Cambridge. With Howard Carter (q.v.) he undertook the excavation of tombs of the 12th and 18th dynasties in Egypt in 1906. He pub. *Five Years' Exploration at Thebes*, 1912. In Nov. 1922 Carter discovered the tomb of Tutankhamen. Shortly afterwards the earl d. at Cairo.

Carnarvon, Henry Howard Molyneux Herbert, 4th Earl of (1831-90), politician, educ. at Eton and Christ Church, Oxford, and succeeded to the title in 1849. He soon became a prominent member of the House of Lords, and in 1858 was made under-secretary for the colonies, succeeding to the secretaryship in 1866. He introduced the Bill (1867) for federating the Canadian provs., the N. America Act. In 1878 he resigned over the E. question and Disraeli's policy. In 1885 he was made lord-lieutenant of Ireland and had an interview with Parnell in which he was alleged to have made overtures on behalf of the Conservative party in regard to Irish Home Rule. He again resigned. In 1887 he advised the investigation of *The Times's* charges against Parnell.

Carnarvon, see CAERNARVON.

Carnarvon, dist. and tn, NW. of Cape of Good Hope prov., S. Africa, 102 m. NNW. of Beaufort W. For the most part the dist. is very dry. Van Wyksvlei, 52 m., provides unlimited water. Traces of mineral oil have been found in the neighbourhood, but a 4400-ft bore hole showed no results. Pop.: Whites, 1204; Coloured, 1893; Others, 50.

Carnarvonshire, see CAERNARVONSHIRE.

Carnatic, or Karnatic, European name of a region of S. India, lying between the Coromandel coast and the E. Ghats. In the 18th cent. it was ruled by the Nawab Sa'adat-Allah of Arcot and his successors, and was the centre of the struggle for supremacy in India between France and Great Britain. In 1801 it came under Brit. rule.

Carnation, name given to many double-flowering varieties of plants which have sprung from *Dianthus caryophyllus*, the clove-pink. They include hardy Border C.s and Picotees; Malmalson and Perpetual Flowering C.s usually grown under glass; and ann. Chabaud and Marguerite C.s, in self and variegated colours of white, yellows, pinks, reds, and mauves. Propagation may be effected by means of layering, cuttings, and seeds, but the most successful of these methods is by layering.

Carneades (214-129 BC), Gk sceptic philosopher, b. Cyrene. He was the successor of Arcesilaus (315-241 BC), founder of the Middle Academy, which embraced the new sceptical reaction against the dogmatism of the dominant schools and as a weapon against the stoics. More is known of his teaching than his life. His masters were Diogenes, the Stoic, and Hegesinus. His chief study was the works of Chrysippus by exposing whose fallacies he estab. his own philosophy.

By C. scepticism was carried over into the realm of ethics as well; and it is narrated that while on a political embassy to Rome in 155, he created a sensation by arguing most eloquently in a public discourse on behalf of justice; and then the next day speaking with equal effect against it. But the fact that his eloquence and brilliant argumentation incited the young Romans to study philosophy was displeasing to Cato, who expelled him.

Carnegie, Andrew (1835-1919), Amer. manufacturer and philanthropist, b. Dunfermline, Fifeshire, Scotland; elder son of Wm C., damask-linen weaver. In 1848 his parents emigrated to America, settling at Allegheny, Pennsylvania. The boy entered a cotton factory as a weaver's assistant, and for some time his wages were a little over \$1 per week. At the age of 14 he became a telegraph boy in Pittsburgh, and learned to telegraph. Then, joining the Pennsylvania Railroad, he became telegraph operator, and ultimately rose to be superintendent of the Pittsburgh div. It was at this time that he laid the foundation of his fortune by the introduction of sleeping-cars on the railway, and by his successful investments in oil lands near Oil City. It was after the Civil war, during which he had rendered valuable service to the gov. as superintendent of military railroads, that his great work began, in the development of the Pittsburgh iron and steel industries. He estab. the Keystone Bridge Works and the Union Iron Works, for the manuf. of steel rails. He then built the Edgar Thomson Steel Works, and in 1893 acquired the Homestead Steel Works. His sphere of business extended with great rapidity, until in 1901 J. Pierpont Morgan made the vast C. enterprise the basis for the U.S. Steel Corporation, and C. himself retired from business. From that time he lived somewhat in the manner of a Scottish laird, at Skibo 'Castle' in Sutherland. Public attention was fixed by the manner in which C. utilised his vast wealth for philanthropic purposes. Chief among his works was the provision and equipment of libraries in the U.S.A. and Eng.-speaking countries. He distributed over £10,000,000 for this purpose alone. For the benefit of Scottish education, he gave in 1901 a sum of £2,000,000 to provide class fees for students, and he also made presentations to Eng. and Amer. univs. In 1903 C. founded the Dunfermline Trust with an income of £25,000, for the improvement of his native tn. He also erected homes and provided funds for his old employees. The C. Hero Fund was started in 1904 for the U.S.A. and Canada; in 1908 for the U.K. Its purpose is 'to place those following peaceful vocations who have been injured in an heroic effort to save human life in somewhat better positions pecuniarily than before, until again able to work.' He d. at Lenox, Massachusetts. See also **CARNEGIE TRUST**. C.'s pubs. include *An American Four-in-Hand in Britain*, 1883, *Round the World*, 1884, *Triumphant Democracy*, 1886, *The Gospel*

of *Wealth*, 1900, *Empire of Business*, 1902, *Problems of To-day*, 1908, and *Autobiography*, 1920. See B. J. Hendrick, *The Life of Andrew Carnegie*, 1933.

Carnegie, bor. of Allegheny co., Pennsylvania, U.S.A., 6 m. SW. of Pittsburgh. It was formed into a bor. in 1894, and gains its name from Andrew C. (q.v.). It possesses large steel and iron works, and manufs. bedding, Diesel engines, lubricants, food, beverages, and toys. Pop. 12,100.

Carnegie Trusts. The *Carnegie Trust for Universities of Scotland* (1901) was for the purpose of improving and extending opportunities for scientific research in Scottish univs. The purpose of the *Carnegie Foundation for the Advancement of Teaching*, instituted in 1906, was to secure adequate retiring allowances for univ. profs. and teachers in the U.S.A., Canada, and Newfoundland. The *Carnegie Endowment for International Peace* (1910) was to promote international peace and a greater understanding of national policies and attitudes. The *Carnegie United Kingdom Trust* (1914) was used by the trustees to develop public libraries by making grants to municipal libraries and to important special libraries.

Carnelian, or Cornelian (Low Lat. *cornelius*, from *carneus*, flesh-coloured, though some say the original spelling was Cornelian, derived from Lat. *cornu*, horn, from the appearance of the stone when fractured; others dubiously refer 'cornelian' to the fruit of the cornel), reddish variety of chalcedony (q.v.), but sometimes brown, yellow, or white. Usually bright and clear. Found chiefly at Cambay, India. Composition: silica (98 per cent), peroxide of iron, magnesia, alumina, potash, and soda. Used for engraved seals.

Carnforth, tn in Lancs, near Morecambe Bay, 6 m. N. of Lancaster. Pop. 3400.

Carniola (Serbo-Croatian *Kranjska*; Ger. *Krain*), former Austrian crown-land in the E. Alps. It was Austrian from the 14th cent. until the First World War (except for the period of the Napoleonic conquest, 1809-13). In 1919 it was divided between Yugoslavia and Italy (see *VENEZIA GIULIA*). Since the It. peace treaty of 1947 it has been almost entirely in Slovenia (q.v.). The prin. tn is Ljubljana (q.v.).

Carnival (Lat. *carnem levare*, to take away meat). C. formerly commenced on the feast of Epiphany, or Twelfth Day, and ended on Shrove Tuesday, but was afterwards restricted to 8 days before Ash Wednesday, the feast preceding the long fast. Its origin was doubtless the Saturnalia of the pagan Romans, who on becoming Christian incorporated many of their rites and customs in their new religion. In Rom. Catholic Germany, *Fasching*, as the C. was called, was the precursor of the drama, and at Nuremberg the first Fast Eve's play was produced. This developed later into masques and mysteries. In Germany only the Catholic cities of the Rhine formerly kept the festival, but it has been revived in Hamburg, Leipzig, and Berlin. As a rule

Protestant countries do not observe it. Italy is the country in which it is most celebrated. On Shrove Tuesday, after sunset, everyone sallies forth with a lighted taper. The object is to put out as many tapers as possible of other people while preserving one's own alight. Special names were given to the chief days, viz. Greasy Sunday, Blue Monday, or Fools' Consecration. On the Sunday before Lent the procession of the Beut Grass takes place, the animals being led through the streets by butchers in costume. At the Nice C., *mi-carême*, an effigy of King C. is paraded through the streets.

Carnivora (Lat. *carnem*, flesh; *vorare*, to devour) form in zoology an important mammalian order. As the name implies, the members are all flesh-eaters, but they are not the only creatures which feed on their fellows—the diet of blood-sucking bats and some marsupials, such as the opossum, bear evidence to this fact—and many of these so-called carnivorous animals are either omnivorous or largely herbivorous. The order is usually divided into the sub-orders *Fissipedia*, or terrestrial members of the group, and *Pinnipedia*, or the aquatic forms, with flippers for limbs; the latter div. is, however, by some zoologists considered to be a separate, though nearly allied, order. The characteristics of the C. are the sharp teeth, small incisors, well-developed brain, simple stomach, reduced or absent caecum, incomplete or absent clavicles; there are never less than 4 toes on each foot; the scaphoid and lunar bones are fused in the manus (hand); and the claws are generally sharp and powerful. In the *Fissipedia* the most typical feature is the dentition, which is obviously adapted to the mode of life of the animals. There are nearly always 6 pointed incisors in each jaw, and 2 long powerful canines. The cheek teeth vary in number, but the last premolar in the upper jaw and the first true molar in the lower differ from the others in their larger size, and are called *carnassial* or *sectorial*; in front of the carnassial tooth are grinders with cutting edges, and behind are others which are broad and tuberculated. In the *Pinnipedia* there is no carnassial tooth, the incisors are never less than 2 in each jaw, and the cheek teeth do not vary in formation. The mode of progression in the former suborder is digitigrade, semi-digitigrade, or plantigrade; in the last the pes and manus are both fully webbed for swimming purposes, but the hind limbs may be used when the animals travel on land. Considerable difficulty is experienced in classifying the C., but the usual plan among the terrestrial forms is to divide them into 3 groups, the *Aeluroides*, represented by the cats (including the tiger, leopard, lion, etc.), the *Cynoldea* by dogs, and the *Arctoidea* by bears. The *Pinnipedia* consists of the walrus and various seals. Fossil species of both suborders have been abundantly discovered, and have proved of great scientific interest. The geographical distribution of the animals is world wide but for Australia and New Zealand, and our

domestic pets include 2 typical representatives in the dog and the cat.

Carnivorous Plants, see INSECTIVOROUS.

Carnot, Lazare Hippolyte (1801-88), Fr. politician, second son of Lazare Nicolas Marguerite C. b. St Omer. He shared his father's exile till 1823, and on his return to France devoted himself to literature and philosophy. Entering politics, he was elected deputy for Paris, 1839, becoming one of the opponents of Louis Philippe; he was minister of education in 1848, and afterwards became a prominent opponent of Napoleon III.

Carnot, Lazare Nicolas Marguerite (1753-1823), Fr. soldier and statesman, b. Noy, Burgundy. He entered the Fr. Army, 1784, as an engineer, having obtained a captaincy on the completion of his studies at the military school of Mazières. In 1786 he pub. his famous *Essai sur les machines en général*. In 1791 he became a member of the National Assembly and an influential power on the Committee of Public Safety. His work was the reorganisation of the revolutionary armies. He became known as 'the organiser of victory' because of his numerous military successes in 1794. C. was a member of the Directory, 1795, but was exiled, 1797. He was recalled to Paris in 1800, and became minister of war, conducting the It. and Rhenish campaigns with great credit. These ended, he retired from public life, and wrote his *Traité de la défense des places*. In 1814 C. came out of retirement to help Napoleon magnificently defending Antwerp against the Allies. He was minister of the interior during the Hundred Days, and subsequently went into exile again, dying at Magdeburg.

Carnot, Marie François Sadi (1837-94), Fr. politician, the eldest son of Lazare Hippolyte C., b. Limoges. A staunch Republican, he was elected to the National Assembly in 1871 and joined the ministry in 1878; in 1880 he was minister of public works, and in 1885 minister of finance. In 1887, after the 'decoration scandals,' he was elected to the presidency and had to meet the danger from the anti-Republican movement under Boulanger; his personal success in bringing his country safely through an acute period of crisis was repeated during the Panama scandals of 1892. He was assassinated by an It. anarchist, Caserio, at Lyons.

Carnot, Sadi (1796-1832), Fr. physicist, b. Paris. He studied at the Ecole Polytechnique, enlisted, and became minister of war to Napoleon, devoting himself to science after Waterloo. His researches on heat led to the foundation of thermodynamics (q.v.) and the improvement of heat engines. His attitude to the 'caloric theory' of heat is not clear, but he probably rejected it. Most of his writings did not become known until some time after his death, but from them it is evident that he had formulated the law of the conservation of energy and knew the value of the mechanical equivalent of heat.

Carnot Cycle, see THERMODYNAMICS.

Carnotite, vanadate of uranium and

potassium, containing a high percentage of uranium oxide; occurs in Utah and Colorado as a yellow sediment. It is a source of both uranium and radium.

Carnoustie, tn and police burgh in SE. Angus, Scotland, 10 m. ENE. of Dundee. It is a favourite watering-place on the N. Sea, with excellent sea bathing and golf. The large artillery and camping grounds, known as Barry Links, are in the neighbourhood. Pop. 5200.

Carnuntum, Rom. fort. station, of which the remains exist near Hainburg (q.v.), in Lower Austria. It was the centre of Rom. military operations on the Danube, and of the trade in amber from the N. belonging first to Noricum and later to Pannonia (qq.v.). The name connected with *karn*, cairn, points to its Celtic origin.

Carnutes, Celtic tribe of central Gaul, between the Seine and the Loire. The chief tns were Cenabum (Orléans) and Autricum (Chartres). The C. were subdued by Julius Caesar, and in return for military services retained their institutions under Augustus, becoming *foederati* of the Rom. Empire.

Carnwath, par. and vil. of Lanarkshire, Scotland, 27 m. SE. of Glasgow. C. vil. is chiefly agric., and forms a residential area for railway workers. Coal is obtained in the neighbourhood of Forth, a vil. in the par. 7 m. from the vil. of C. Pop. 6160.

Caro, Annibale (1507-66), It. poet, b. Civitanuova in Ancona. He lived chiefly in Rome. In 1543 he became the confidential secretary of Pietro Lodovico, Duke of Parma. He is famed especially for his fine trans. of the *Aeneid* and Longus' *Daphnis and Chloë*. Other works include a comedy *Gli Straccioni*, c. 1544, *Rime*, 1569, sonnets, and an amusing eulogy of the big nose of the president of the Accademia della Virtù, Leoni Ancona. His poetry is marked by high qualities, and his letters by remarkable finish of style.

Carob-tree, see CERRATONIA SILIQUA.

Carol (Charles) I (1839-1914), King of Rumania. Prince Karl Eitel, second son of Prince Karl Anton of Hohenzollern-Sigmaringen, the Rom. Catholic branch of the Hohenzollerns, was b. Sigmaringen. Served in the Prussian Army; and, on the dethronement of Alexander John, was elected Prince of Rumania (then under Turkish suzerainty), April 1866. He was energetic in developing the country; but in 1870-1, faced by the Fr. sympathies of many of his subjects, an unsuccessful revolution, together with the failure of the speculator to whom he had entrusted an important railway contract, he offered to abdicate. The ability of a Conservative statesman, Lascar Catargi, tided over this unfortunate period. Prince C. took the field as an ally of Russia in 1877, and on 21 May the independence of Rumania was proclaimed. On 22 May 1881 C. was crowned King of Bucharest, with a steel crown made from a Turkish gun. He married Princess Elizabeth of Wied—'Carmon Sylva,' the poetess and musician—in 1869. On the death of their only

child the succession was settled on a nephew, Prince Ferdinand. The opening of the First World War, wherein Rumania's interests were against the Central Powers with which the king was linked, caused much friction between him and his ministry—terminating only with his death at Pelesch, 10 Oct.

Carol (Charles) II (1893-1953), King of Rumania, *b.* at the castle of Pelesch (Sinaja); son of King Ferdinand (q.v.) and Marie, daughter of the Duke of Edinburgh. After a fine military record in the First World War he married at Odessa a Moldavian named Zigi Lambrino, and they had a son. In 1919 he renounced his claim to the succession, since his wife was not recognised as princess; but his parents persuaded him to give her up, the marriage was annulled as illegal for want of banns, and C. was sent on a mission to Japan. On his return he married at Athens, 10 Mar. 1921, Helen, daughter of King Constantine of Greece, by whom he had issue the Prince Mihail (Michael), *b.* 1921. After attending the funeral of the queen-dowager of England, Nov. 1925, instead of going home he went to Paris and thence to Milan, where he formally renounced the succession, 28 Dec. 1925. The National Assembly accepted his renunciation, 4 Jan. 1926. C. went back to Paris, 24 Feb. 1926, accompanied by Mme Lupescu. In Paris, in Mar., Mme Lambrino claimed damages for the annulment of her marriage. C. took the surname of Caraiman; the infant Prince Michael succeeded his grandfather, 20 July 1927, and Princess Helen obtained a divorce from C., 21 June 1928. By that time he had withdrawn his renunciation, and been expelled from England, 16 May 1928, for intriguing against the Rumanian Gov. He resided in Brussels for a while. On 6 June 1930 he flew to Bucharest, a new ministry was formed, and the regency resigned. On Sunday, 8 June, Carol II was proclaimed, while his deposed son was given the titles of crown prince and Prince of Alba Julia. After the outbreak of the Second World War the Iron Guard began an agitation for C.'s abdication, and after riots C., on 6 Sept. 1940, signed a proclamation announcing his decision to resign in favour of his son Michael. His efforts to stem the pro-Axis current in Rumania were unavailing and he left the country. He settled in S. America, where he married Mme Lupescu in 1947. They later settled in Portugal.

Carol (O.F. *carole*, a dance with song), in accepted Eng. usage, a song for Christmas, but also, in its early (15th-cent.) stages, a simple kind of part-song, unconnected with that festivity. Diez suggests that the origin of the word is 'chorus'; others derive it from *corolla*, a little crown or garland. The earliest meaning applied to the word seems to have been a 'ring-dance' or 'to dance in a circle.' Stonehenge, once called the giants' dance, was also the giants' carol. Dancing and singing were part of religious worship from the earliest times. Carolling,

dancing with singing, was handed on from pagan ritual to the Christian Church. In 1209 the Council of Avignon forbade dancing and secular singing in churches. In the cathedral of Seville the choristers perform a castanet dance round the lectern thrice a year. Caxton, in the *Golden Legend*, refers to the 'carolles of virgyns' and Chaucer uses the word in 'I saw her dance so comely, carol and sweetly sing.' In Spain many early C.s refer to gipsy girls dancing and singing. The Manx people have a collection of C.s, locally called 'carvels,' which were sung in the churches on Christmas Eve, each singer bringing with him a candle. Most of these Manx C.s consist of tales of judgment day and hell, and not of the Nativity or the joyful themes of Christmastide. The Bretons also have a large collection of anct C.s. The earliest printed collection was issued in 1521 by Wynkyn de Worde; this contains the famous *Boar's Head Carol*, still sung at Queen's College, Oxford, to usher in the boar's head; and this is an example of the 15th-cent. part-song type mentioned above. There are numerous collections of Fr. C.s, called *Noëls*, and sev. Ger. *Wiegenlieder*, cradle-songs associated with the Babe of Bethlehem, the lullaby *Dormi, Fili* being one of the best known. That the singing of C.s as an excuse for the asking of alms was a very early custom seems likely from an Anglo-Norman C. now in the Brit. Museum. The word C. is freely used by poets in reference to people or birds singing joyously, such as in Tennyson's *Elaine*, 'carolling as he went a true-love ballad,' or in Spenser's *Epithalamion*, 'the cheerful birds do chaunt their lays and caroll of love's praise.'

Carolan, Turlough (or Terence) (1670-1738), Irish harper, *b.* near Nobber, co. Meath. He was not a bard, as tradition has it, and Carolan is not an authentic form of his name. At about 18 he had smallpox and became totally blind; a patroness provided him with money, a horse, and a guide, and he travelled all over Ireland playing and singing his own compositions, teaching the harp and staying as an honoured guest at country houses.

Carolina, North and South, *see* NORTH CAROLINA and SOUTH CAROLINA.

Caroline Amelia Elizabeth, of Brunswick (1768-1821), Queen of Great Britain, wife of George IV. was the daughter of Charles Wm Ferdinand, Duke of Brunswick, and of Princess Augusta of England, a sister of George III. She was a bright, headstrong, foolish woman when she came to England in 1795 to marry the Prince of Wales. The marriage was unhappy from the beginning. After the birth of a daughter, Charlotte (1796), a formal separation took place, and the princess went to live at Blackheath. Weary of continual persecution at the hands of her husband, she went abroad in 1814. When she became queen 6 years later she returned to England. She was now tried before the House of Lords for alleged misconduct, but the bill was not proceeded with, Brougham (q.v.) defending the

charges against C. with great eloquence. Popular feeling in the country was strongly on the princess's side in the quarrels with her husband; but there seems little doubt that she was an extremely difficult woman to deal with, and that the couple were fundamentally incompatible, with faults on both sides. She d. a few days after George IV's coronation, at which she was not permitted to be present. See lives by L. Melville, 1912, and E. A. Parry, 1930.

Caroline Matilda (1751-75), Queen of Denmark and Norway, was the daughter of Frederick, Prince of Wales, and sister of George III; in 1766 she married Christian VII, King of Denmark and Norway. The marriage was unhappy; Christian being mentally feeble, and C. fell under the influence of the royal physician, Struensee (q.v.); he was popularly believed to have been her lover. When Struensee was arrested she shared his fate and made an attempt to shield him. On his execution she was divorced, and after a short imprisonment was, on George III's request, sent back to England.

Caroline Wilhelmina (1683-1737), Queen of Great Britain, wife of George II, the daughter of John Frederick, margrave of Brandenburg-Anspach. Left an orphan in 1696, the girl lived at Berlin with her guardians, the Elector Frederick III of Brandenburg and his wife, Sophia Charlotte, daughter of the Electress Sophia, and it was proposed that she should marry the Archduke Charles; but C.'s refusal to become a Catholic caused the proposal to be abandoned, and in 1705 she married George Augustus, then electoral Prince of Hanover, by whom she had sev. children, the eldest being Frederick, afterwards Prince of Wales. From 1727 to 1737 her political influence was enormous, and Walpole (q.v.) owed much of his power to C.'s consistent support. See P. Quennell, *Caroline of England*, 1939.

Caroline Islands, scattered archipelago in the Pacific Ocean, included in Micronesia, between 5° and 10° N. and 135° and 165° E. The total land area is 460 sq. m. Pop. about 40,000. They are divided into 3 groups: E., W., and Central. The chief is. are Ponape and Kusaie in the E. group, Yap in the W., and Truk in the Central. The Palau Is. are administered from Yap. The climate is healthy, but the is. are subject to severe storms and the rainfall is heavy. Among the chief products are copra, pearl, and turtle shell, and *bêche-de-mer*. The natives, very mixed ethnologically, are excellent boat-builders and navigators and successful agriculturists. Yap is remarkable for its peculiar currency; in addition to the ordinary shell-money, huge limestone disks are used, from 6 in. to 12 ft in diameter; these are brought from the Palau Is., and are piled round the chief's treasure-house and apparently regarded as public property. In Ponape and Kusaie colossal stone structures exist, pointing to a prehistoric race well advanced in general culture. In the is. of Lélé the ruins appear like a citadel with basaltic ramparts; there are also

numerous canals and apparently artificial harbours with high sea walls built in the water. The whole is. of Ponape is strewn with basalt blocks of huge size put together without mortar, once having formed massive walls. The C. I. were discovered in 1537 by the Portuguese Diego da Rocha, who named them *Sequeira Is.*; in 1686 they were renamed by Adm. Francisco Lazearo in honour of Charles II of Spain. The C. I. were successively ruled by Portuguese and Spanish from 1537 to 1899, when they were bought by Germany. In 1919 they were assigned to Japan under the mandate of the League of Nations. Naval and seaplane bases were built among the is., which remained in Jap. hands until Sept. 1945 when they were surrendered to the U.N. The naval base at the Ulithi atoll has since been dismantled. The is. were taken over by the U.S.A., July 1947.

Carolingians, see CARLOVINGIANS.

Carolus, Eng. gold coin, struck in the reign of Charles I. It was rated at £1, but appreciated in value to £1 3s. 9d. Its official title was unit, and it was also called a broad. A C. was also a base silver coin of Charles VIII of France. 'C. dollars,' Sp. coins of Charles III and IV, were long current in the E., especially in China, containing 8 reals; they were known as pieces of eight. They are still current in some of the tea-growing dists. of China, and as the people hoard them they have greatly exceeded their intrinsic value.

Carolus-Duran, name adopted by Charles Auguste Émile Durand (1837-1917), Fr. painter, b. Lille. He first studied at the Lille Academy, and then went to Paris; in 1861 he travelled in Italy and Spain, where in particular he studied the style and technique of Velázquez. His first success was with a subject picture, 'Murdered, or the Assassination,' now in the Lille Museum. Later he became a portrait painter. In 1869 a portrait of his wife, called 'The Lady with the Glove,' was bought for the Luxembourg. He was the head of one of the prin. studios in Paris; and some of the most celebrated artists of his day, including J. S. Sargent, were his pupils. In 1904 he was made a member of the Académie des Beaux-Arts, and in 1905 director of the Fr. Academy at Rome.

Carolus Magnus, see CHARLEMAGNE.

Caronia, tn in Sicily (q.v.), overlooking the N. coastal plain, 63 m. ESE. of Messina (q.v.). Pop. 6000.

Carossa, Hans (1878-1956), Ger. prose writer and poet, b. Tölz, Bavaria. He studied medicine, and practised at Passau, Nuremberg, and Munich. His profession greatly influenced his writings, both as regards the subject-matter of some of his prose works (*Doktor Bürgers Ende*, '913; *Der Arzt Gion*, 1931), but also in his objective outlook and keen observation. Many of his works are purely autobiographical: *Eine Kindheit*, 1922, *Rumänisches Tagebuch*, 1924, *Verwandlungen einer Jugend*, 1928, *Führung und Geleit*, '933, *Das Jahr der schönen Täuschungen*,

1941, *Aufzeichnungen aus Italien*, 1947, and *Ungleiche Wellen*, 1951. Although his life was outwardly uneventful, his writings are admirable examples of broad-mindedness, tolerance, and wisdom. C. also pub. a volume of lyrical poems in 1938. See F. Klatt, *Hans Carossa*, 1937; G. Schaefer, *Hans Carossa*, 1947.

Carotenoids, generally highly unsaturated, fat-soluble, yellow or orange plant pigments which are widely distributed in nature and exemplified by carotenes, the isomeric hydrocarbon pigments in carrots and lycopene in tomatoes. Chemical knowledge of C. has been largely due to the application of chromatography and development of micro analytical technique and about a hundred distinct natural C. are now recognised, some of which exist in stereoisomeric forms. Carotene itself has the molecular formula $C_{40}H_{56}$ and all the known C. contain 40 or less carbon atoms, their constitution being of a regular pattern of isoprene units and polyene systems. Although the animal organism is unable to synthesise C., more is known of the significance of some C. in the animal kingdom than of their importance to plant life. Thus the occurrence of C. in green leaves suggests that these pigments have an important role in photosynthesis but this is without experimental foundation. The structural relationship between carotene and Vitamin A confirms the long held suspicion of the connection between carotene and the growth factor in the animal kingdom, since β -carotene can act as a substitute for Vitamin A₁. The conversion of β -carotene into Vitamin A₁ has been achieved, but although the change is apparently simple, viz. $C_{40}H_{56} + 2H_2O \rightarrow 2C_{20}H_{32}OH$, the large scale production of Vitamin A₁ has not been achieved. However, the synthesis of Vitamin A₁ has led to the synthesis of a variety of C. Whilst the role of C. in the process of vision has not been completely elucidated, it is known that visual purple is a protein-retinene complex which liberates the retinene component on exposure to light and in the visual process this component is converted into Vitamin A₁. In the dark the reverse process occurs. Although the study of C. has been going on since the time of Berzelius, it is only recently that many problems regarding the synthesis of C. have been overcome by the use of acetylenic intermediates, but the biochemical aspects of C. will doubtless reveal further knowledge.

Carotid Arteries, 2 arteries which convey the blood supply to the head. They pass through the neck on either side of the windpipe, and each opposite the angle of the jaw divides into two, one branch, the external, serving the face and scalp, and the other, the internal, branch the brain. The pulsation in these arteries is easily felt from the surface.

Caroto, or Carotto, Giovanni Francesco (or Gianfrancesco) (c. 1480-1546). It. painter, b. Verona; worked in Mantua under Mantegna, whose style he imitated. After returning to Verona he painted

frescoes in the church of San Tommaso Cantuariense (Thomas à Becket). Among his best works are the frescoes in Sant' Eufemia, Verona, depicting scenes from the book of Tobit. One of his earlier works was a 'Virgin and child, with an infant John the Baptist' in the Gallery of Modena. There are pictures by C. in many churches and galleries of Mantua and Verona, including his 'Glory of the Virgin' (signed and dated 1545) in Verona, where he d.

Carp, Petre (1837-1919), Rumanian statesman. b. Jassy. He was the leader of the Young Conservative or Junimist party, the Junimea being a literary society which he founded with Rosetti and Maloirescu and changed into a political association. The object of the party was to improve the condition of the peasantry, introduce a gold standard, and develop industries by means of foreign capital. He came into power in 1888, passed a Bill for the distribution of state lands, and succeeded in introducing a gold standard. He was, however, unable to retain office, and was succeeded, 1891, by L. Catargiu. He trans. some of Shakespeare's plays into Rumanian. In the Privy Council, from 3 Aug 1914, he alone supported King Charles's desire to side with the Central Powers in the First World War.



CARP

Carp (*Cyprinus carpio*) belongs to the order Ostariophysii of the Teleostei. Originally it belonged to Asia, but it has been introduced into Europe and for sev. cents. has flourished in Britain. The fish, which is closely related to such well-known species as goldfish and minnows, often grows to a very large size, and may weigh as much as 100 lb.; examples have been known to attain a great age. In colour they are brown above, light beneath, have a compressed body covered with large scales, a long dorsal fin and shorter anal fin, and round the mouth depend 4 barbels. The C.

usually inhabits quiet lakes, ponds, or sluggish streams, and during winter hibernates in mud; it is capable of living for a considerable time out of water. Its food is either vegetable or animal. The female is very prolific and spawns on weeds in May or June. The Crucian or Prussian C., a native of Europe, has the technical name *Carassius carassius*, while *C. auratus*, or golden carp, is the goldfish (q.v.).

Carpaccio, Vittore (c. 1450-1523/6), It. painter, b. Venice, of an old Venetian family, the correct name being Scarpozza. He may be regarded as a forerunner of the finest Venetian masters. His chief works were painted between 1490 and 1519. He was certainly a pupil of Lazzaro Bastiani, rather than his master, as formerly held. His greatest works are at Venice; the series of pictures in San Giorgio degli Schiavoni, brought so prominently to notice by Ruskin, was painted by order of the hospice of San Giorgio from 1502 to 1508. The *St Ursula* series (Accademia, Venice) is well-known. 'St Ursula leaving her father' (National Gallery) adequately exemplifies his style. See P. C. Molmenti and C. Ludwig, *Life and Works of Vittore Carpaccio* (trans. by R. H. Cust, 1907); G. Fiocco, *Carpaccio*, 1931.

Carpathians, great mt system in central Europe, extending from Bratislava to Orsovo, in crescent form, for 800 m. The Danube valley divides them from the Alps, and the March from Silesia and the Moravian Mts. After forming the boundary between Hungary and Rumania they turn S., cut by the Danube, which flows in a picturesque gorge between Bazias and Turnu-Severin. They then slope down to the Rumanian plain in beautiful wooded declivities, intersected by valleys of numerous rvs., fed by the high rainfall of the dist. For the purpose of classification the whole system may be divided into 2 great groups, the E. and W. C. The E. C. stretch from the mouth of the Nera to the source of the Theiss. The W. C. start at the Theiss and terminate at Bratislava. The chief groups of mts are Little C., Beskids, Central C., White Mts, Lomnitzer Spitze, Eisthaler Spitze, and the High Tatra group, including the highest peak in the C., Gerisdorfer, 8737 ft. Few mts reach or pass into the snow line. There are no glaciers, but glacial lakes, *Meerangen*, are hidden away in the snow-bound recesses at an elevation of 6000 ft. The best-known passes are Teregovva, from Orsova to Temeswar; Vulkar, in the valley of the Schyl; Rottenthurm, in the S. Transylvanian Alps, in a gorge formed by the Alata; Tursburg, between Bucharest and Brasov; and Jablunka, between Bratislava and Cracow. The C. form a watershed for the Baltic and the Black Seas, the most important rvs. rising there being the Dniester, Vistula, Theiss, Maros, and Szanos. Besides having more mineral wealth than any other mt system of Europe, the region of the C. is rich and fertile, and well wooded with oaks, beeches, evergreens, and firs. In the less

civilised parts wild animals are found, including the wolf, bear, and lynx, and occasionally chamois and ibex. The lammergeier, or bearded vulture, is found here. Geologically there are 4 zones of the C.: (1) the outer zone lying towards Russia, of soft Tertiary rock, containing salt and petroleum; (2) the sandstone zone, extending SE. from the March; (3) the crystalline zone of Palaeozoic rocks; (4) the volcanic zone, containing no active volcanoes, but subordinate mts of volcanic origin. Gold, silver, quicksilver, copper, and iron are the chief minerals obtained. See I. Phillimore, *In the Carpathians*, 1912.

Carpeaux, Jean Baptiste (1827-75), Fr. sculptor, b. Valenciennes. His father was a mason, and during his early years the family was extremely poor. For 2 years he worked in a drawing school in Paris, and in 1854 entered the École des Beaux Arts. He was awarded the Grand Prix de Rome for his statue of 'Hector with his Child, Astyanax.' At Rome he felt the influence of Michelangelo, and became more vigorous in style and passionate in expression. C. must be regarded as one of the influences which have helped to free modern sculpture from the weight of academic classicism. Among his chief works are 'La Palombella,' 1856, 'Neapolitan Fisherman,' 1858, 'Girl with a Shell,' 1869, 'Ugolino and his Children,' 1863, and 'Statue of the Prince Imperial,' 1866, after which he was made a chevalier of the Legion of Honour. In 1869 he executed one of the groups, 'Dancing,' for the opera house, which aroused much prejudice by its strong realism, vigour, and vitality. His last work, a fountain, is in the Avenue de l'Observatoire, Paris. Many of his drawings and studies are at Valenciennes.

Carpel, one of the divs. or units of the pistil of a flower, enclosing ovules. There may exist only one C. in the flower, and the gynoecium is then said to be monocarpellary, e.g. sweet pea and other legumes, but if more than one should be present it is polycarpellary; in any case the C. or Cs. are important parts of the female essential organ of the flower, the gynoecium. When the C.s of a polycarpellary pistil are united to one another the condition is syncarpous, e.g. primrose; when they are free from each other it is apocarpous, e.g. buttercup. The fusion of C.s affects the way in which the ovules are placed within the ovary, e.g. those which are folded on themselves first, and then fused by their adjacent margins, bear ovules in the centre, when the placentation is said to be axile, e.g. bluebell. The placenta is a swollen cushion formed from the fused margins which are themselves called septa. The style is a prolongation of the upper part of the C., and the stigma is the terminal knob born at the apex of the style.

Carpentaria, Gulf of, situated on the N. coast of Australia, between Capes Arnhem and York. The most important is. contained in it are Groote Eylandt and the Wellesley Is., the largest of which is Mornington Is. It receives a number of

rivs., including the Roper, the Mitchell, the Flinders, the Leichhardt, and the Albert. The coast is low and swampy. It was named in 1823 by Carstensen, after Pieter Carpentier, Governor-General of the Dutch Indies.

Carpenter, Edward (1844-1929), author, b. Brighton, son of Charles C., barrister and retired naval officer. On leaving school at Brighton he went to Trinity Hall, Cambridge, and was tenth wrangler in 1868. He took orders, and was curate to F. D. Maurice at St Edward's. Becoming dissatisfied with his creed, he renounced orders and became univ. extension lecturer on astronomy in Yorks tns. In 1883 he took a cottage at Millthorpe, Derbyshire, worked in the fields, and grew his own fruit and vegetables. He wrote poetry: *Narcissus*, 1873, and *Towards Democracy* (under the influence of Whitman), 1883—and prose: *Civilisation, its Cause and Cure*, 1889, *Love's Coming of Age*, 1896, *Angels' Wings*, 1898, *Art of Creation*, 1904, *The Intermediate Sex*, 1908, *My Days and Dreams* (autobiography), 1916. He visited Ceylon, and his *From Adam's Peak to Elephantia*, 1892, extols the oriental peace of mind. His whole life was in fact a reaction against Victorian conventions and respectability. He d. at Guildford.

Carpenter, Lord George (1657-1732), general, entered the army, 1672. He served in Ireland and Flanders, and in Spain as quartermaster-general to Peterborough, 1705. He commanded the cavalry at Almanza, 1707, at which battle he was second in command. He joined the Hanoverian party, defeating the pretender at Preston, 1715. In return for his services he was made Governor of Minorca and commander-in-chief of the forces in Scotland. He was created baron, 1719; M.P. for Westminster, 1722-1729. His grandson was created Viscount Carlingford and Tyroconnel in the Irish peerage, but the earldom became extinct in 1853. See *Life of Lord George Carpenter*, 1736.

Carpenter, John (c. 1370-1441), merchant, London's tn clerk, 1417-38, and M.P. for the City in 1436 and 1439. C. compiled the City's privileges in the *Liber Albus*. He left a bequest which formed part of the foundation of the City of London School.

Carpenter, John Alden (1876-1951), Amer. composer. b. Park Ridge, Illinois. He studied under Amy Fay and Seeböck, and at Harvard under J. K. Paine. His first notable works were *Improving Songs for Children*, 1907, and *Gitanjali*, a song-cycle of poems by Tagore. His first symphony, *Sermons in Stones*, was written in 1917. A ballet pantomime, *The Birthday of the Infanta* (after Oscar Wilde), was produced by the Chicago Opera Co. in 1919, and *Skyscraper*, also a ballet, by the Metropolitan Opera Co. of New York in 1926. For the Washington bi-centenary in 1932 he wrote *Song of Faith* for chorus and orchestra, and *Patterns* (piano and orchestra) was played by the Boston Symphony Orchestra in the same year. His symphonic poem, *Sea*

Drift, followed in 1933; concerto for violin and orchestra in 1937; and his symphony for the fiftieth anniversary of the Chicago Symphony Orchestra in 1940. In 1941 he wrote *Song of Freedom* for chorus and orchestra.

Carpenter, Dr Lant (1780-1840), Unitarian minister and theological writer, b. Kidderminster. He studied at the academy of Northampton (1797), and at Glasgow Univ. (1798-1801). He became an assistant master at a school in Birmingham, and subsequently librarian of the Liverpool Athenaeum (1802-5), when he was chosen as Unitarian minister of a boarding-school in Exeter (1805-17). From 1817 to 1829 he held a similar position in a school at Bristol. He was drowned in Italy, off the coast of Leghorn. Dr C. pub. numerous sermons and polemical tracts, and wrote *Unitarianism, the Doctrine of the Gospel*, 1809, and *Systematic Education* (2 vols.), 1815, etc. His memoirs were ed. by his son, R. L. C., in 1842.

Carpenter, Mary (1807-77), philanthropist, b. Exeter, daughter of Dr Lant C., a Unitarian minister, and sister of Dr William Benjamin C. Educ. in her father's boys' school at Bristol. Her interest in poor children was aroused by Dr J. Tuckerman of Boston, and in 1835 she started a working and visiting society and later a ragged school with a night school in the poorest part of Bristol. The visit of the Hindu philanthropist, Rammohun Roy, 1833, aroused her sympathies with India, and the first of her journeys to the E. was taken, 1866, where she initiated sev. reforms for women and children. She wrote many books embodying her schemes for the education of destitute children and those on the border of a criminal or vagrant life. Her book *Juvenile Delinquents* was instrumental in the passing of the Youthful Offenders Act, 1854. She d. in Bristol. See life by J. E. C., 1879.

Carpenter, William Benjamin (1813-85), naturalist, son of Dr Lant C., b. Exeter. He graduated M.D. at Edinburgh, 1839, was made F.R.S. in 1844; gold medallist of the Royal Society, 1861; and was Fullerian prof. of physiology at the Royal Institute from 1845, being a most popular and admirable lecturer. His works include *Principles of General and Comparative Physiology*, 1839, and *The Microscope and its Revelations*, 1856. *Principles of Mental Physiology* (4th ed.), 1876. He was registrar of the univ. of London, 1856-79.

Carpenter Bee (*Xylocopa*), so named from its habit of boring holes in dry timber and forming little cells in which to lay eggs. The partitions between the cells are made of the wood-dust fastened together with saliva. *X. virginica*, a N. Amer. species, is as large as a humble bee.

Carpentier, Georges (1894-), Fr. boxer, b. Lens, near Calais, and worked in a colliery as a boy. At a boxing academy in the tn he attracted the attention of the proprietor, François Descamps. When 14 he won a fight against Salmon, one of the best-known boxers, at 7 st. 2 lb. He

won the championship of France in every weight and div. On 16 July 1914 he fought Gunboat Smith at Olympia, London, for the world's heavyweight white championship, and won it through the disqualification of Smith for a foul. His most sensational fight in England was with the heavyweight Joe Beckett on 4 Dec. 1919, for the championship of Europe, the Prince of Wales being present at the match. Only 2 blows were struck, Beckett being knocked out a few moments after the fight started. He won the light heavyweight championship of the world and fought Dempsey in New York, 3 July 1921, for the world's heavyweight championship, and was decisively beaten in the fourth round. He served in the Fr. Air Force during the First World War, and again on the outbreak of war in 1939 until the fall of France in 1940.

Carpentras, Fr. tn in the dept of Vaucluse, on the Auzun, and on the C. Canal, 14 m. NE. of Avignon (q.v.). It dates from Rom. times, and was formerly the cap. of Comtat Venaissin (q.v.). It has a fine Gothic church (1405-1519, formerly a cathedral), 17th-cent. law courts, an 18th-cent. synagogue, anct walls, and a splendid 18th-cent. aqueduct. There is also a Rom. triumphal arch. There is a textile industry, and there is a market for fruit and vegetables. Pop. 14,000.

Carpentry may be defined as the craft of selecting, working, and jointing timber for structural purposes. In building C. covers all carcassing work: roofs, floors, partitions; centring, shuttering, and shoring. In furniture it provides the roughest types. Heavy work, ranging from case-making to bridge building, also comes within the sphere of C. The remainder of this article outlines the traditional processes of the craft, but shortage and high costs of timber are restricting its use in building and favouring the use of alternative structural materials.

Any assemblage of pieces of timber connected together is called a frame. The points of meeting of the pieces of timber in a frame are termed joints, and one of the first requisites in C. is a knowledge of the various ways of joining the pieces in order to stand different strains and pressures. When one piece of timber is not long enough, it is joined to another piece in the same direction by various methods. The roughest method of doing this is by fishing; the ends of the beams are placed together, and a piece of timber is placed on each side and secured by bolts passed through the whole. Another method is halving the beams so that they present a level face when joined together, and can be united by means of bolts. Scarf-joints are employed when it is necessary to maintain the same depth and width throughout the beam. In this method a part of the thickness of the timber is cut away from each beam; the parts cut away are on opposite sides, and correspond to each other, so that the beams will fit into

each other and can be bolted. Different varieties of scarf-joints are employed where the timber is subjected to compression, tension, or to a bending strain, etc. Hard-wood pieces called keys are inserted into the holes of a scarf-joint before the bolts in order to compress the beams closely together; they must not be driven in too hard or the fibres of the wood will be strained. In bolting together scarf-joints side plates of iron are used to protect the wood. Another mode of joining timber is by mortise and tenon, which is employed wherever one piece of timber meets another without crossing it. A hole called a mortise is made in one piece of timber, and a projecting portion called a tenon is left on the other. The tenon is driven into the mortise and secured in position by glue, or by a pin penetrating it laterally through the side of the mortised beam, or by an external iron strap which passes round the beam and is riveted in the other, the beam which has the tenon. When the two pieces of timber do not meet each other at right angles, modifications of the mortise and tenon joint are adopted, so that a bearing surface may be provided which is at right angles to the direction of the thrust exercised by the entering timber. Other operations performed when timbers cross each other are notching, cogging, and housing; these joints must be strengthened by bolts or straps. When greater strength is required than a single beam will give, the processes of building and trussing beams are used. Building beams is combining 2 or more beams in depth so as to have the same effect as one large beam; the beam is cut in two and supported with cross-beams in the operation of trussing.

The framework by means of which the covering of a building is supported is known as the roof. The simplest form of roof consists of a series of pieces of timber with their own ends resting on the walls and their other ends meeting at a ridge-pole. These are called rafters, and their lower extremities are connected by a piece of timber called a tie, as otherwise this framework would thrust out the roof when loaded with the weight of the covering. The whole frame is known as a couple; such a simple form of roof, however, can only be used when the building is less than 20 ft long. When the tie is longer than that, it is apt to sag in the middle, and a fourth piece, called a king-post, is added to unite it directly with the apex of the rafters. Cross-pieces, called struts, are added if the rafters are liable to sag; their centres are thus united to the centre of the tie. If the span is longer than about 30 ft it is inadvisable to leave the rafters unsupported for half their length, and the following formation is substituted: The centre of each rafter is joined to the tie by a piece which falls perpendicularly on it; the rafters are also joined to each other by a piece which runs parallel to and above the tie. The perpendiculars and the section of the tie enclosed by them thus form a parallelogram with the rafters. The

horizontal piece is called a collar-beam, and the suspending pieces queen-posts. The whole frame is known as a truss; the trussed frames are placed at intervals of about 10 ft. They support horizontal pieces known as purlins, which run the whole length of the roof, and support the common rafters and their covering. All roofs, of whatever size, are founded on the above models, unless it is not desired that there should be a tie-beam, as in churches, etc. The walls are then made stronger or the roof principals are modified in shape to meet the greater horizontal pressure.

The framing of timber supporting the floor of the room above and the ceiling of the room below is called the naked flooring; there are 3 main kinds of flooring—single, double, and framed. Single flooring consists of one series of joists which stretches right across from wall to wall without any support. The flooring boards are laid on the top of these joists, and to the under side is affixed the ceiling of the lower storey. Double flooring has a middle series of binding joists, resting on the walls in the same way as the joists of single flooring; above these joists are the bridging joists and below are the ceiling joists. Both these are notched into the main joists where they cross them, and support respectively the floor above and the ceiling below. Framed flooring has beams in addition to the binding, bridging, and ceiling joists; the binding joists do not cross the whole width of the room, but are framed into these beams at intervals. A double ceiling of lath and plaster is occasionally used to deaden sound; the most general method, however, is the insertion of plugging above the ceiling. Framed floors are used where there are large spans, double floors ensure evenness of floor and ceiling, and single floors give strength combined with lightness where the spans are not very great. If the span for a single floor exceeds 8 or 9 ft, the joists should be strutted together to prevent twisting. Rough wooden profiles of the cornices of a room are made, and afterwards lathed round and plastered. This process is known as cornice bracketing.

The frames of timber which are used to divide the upper storeys of a building into rooms are called partitions. When these are not required to bear any heavy weight they are formed as follows: A piece of timber, called a sill, is laid along the floor, and a corresponding piece along the ceiling joists. The lath is nailed to the vertical pieces, known as quarters, with which the space between is occupied. If the partition has to support any weight it has to be trussed with posts and braces, and brickwork or concrete may be used to fill up the space. When a staircase is made of wood, the pieces of timber upon which it rests, and which form the framework, are known as the carriage. They are 2 in number, and are inclined at the angle which it is desired that the steps should have; they are called technically rough strings. A piece of timber, which projects horizontally from the upper level to which the staircase leads, forms

the support for the rough strings and also for the joists of the landing; this is called a pitching or apron piece. When bridges or vaults are in course of construction, curved frames are needed to support the arch stones; these frames are known as centres. The ribs of which the centres are composed are built of a series of short timbers shaped to the curve required; they are placed about 6 ft apart, and are connected by horizontal ties as well as by diagonal bracing. The centres serve to support the narrow boards which carry the stones of the arch. When the arch is properly keyed the centres are struck gradually so that the arch takes its proper bearing slowly. Staging is built up of 2 rows of standards, or large square timbers, resting on a sill of timber on the ground. Longitudinal beams at the top support a platform, on which a small railway may run. If the staging is large and required for a travelling crane, it is known as a gantry. See also JOINERY. Consult R. Greenhalgh, *Practical Joinery and Carpentry*, 1923, and *Joinery and Carpentry* (4 vols.), 1939-40; C. Ellis, *Modern Practical Carpentry*, 1927; A. E. and T. R. Bridgwood, *Carpentry and Joinery (Advanced)*, 1952.

Carpet (It. and Low Lat. *carpita*, a coarse cloth, from Lat. *carpere*, to pluck), heavy woven fabric, used as a covering on floors. C.s were first made and used in the E., where the custom of sitting cross-legged on the floor and of praying in a low, crouching position necessitated the use of some soft covering to the floor. When C.s were first brought to England, they were used as a rich covering for beds and tables, straw, dried rushes, or sand being spread over the floors. When C.s were first used for floors they were regarded as a great luxury, and only in keeping with a lady's boudoir. Hand-woven tapestries were commonly made during the Middle Ages in convents and by ladies of rank, and were sometimes spread over the floors. The industry first developed in France, where a factory was estab. in 1607 at the Louvre by Henry IV. Other C. factories were estab. in Challott, 1627, and at Beauvais, 1664. In 1695, with the revocation of the Edict of Nantes, most of the weavers—for the majority were Protestants—fled across the Channel, and thus the industry was started in England. The Flemish weavers first settled in Bristol, but the knowledge of the art soon spread to N. tns, and notably to Kidderminster, Dewsbury, and Glasgow. The chief varieties of C. are the Brussels, Wilton, Persian, Turkey, Indian, Kidderminster, and Axminster. Rugs also came to Britain originally from the E., where the rug or C. is the most important, often indeed almost the only, furnishing of the house. Indian, Persian, and Turkish C.s and rugs are the best examples of the art.

General principle of manufacture. The original method of C. making was by hand, and to this day C.s are made both in Europe and in oriental countries in precisely the same manner as of old. The principle is very simple. The warp threads forming the chain are wound on

2 horizontal beams and the weavers sit side by side in front, the C. as it is woven being gradually wound on the lower beam and the warp correspondingly unwound from the upper beam. The yarn for the pile is cut into tufts, and knotted by the weaver. The interlocking of warp and weft forms the weave of the C. Hand-weaving is slow, and therefore the product is very expensive. The first type of machine-made C. to be made in England was the Brussels C.

Brussels carpet. This C. is composed of a mixture of linen and worsted, the cloth or reticulated part of the structure being entirely of linen, and the worsted only showing on the upper surface and making the pattern. Through the coarse linen fabric worsted thread of different colours is drawn and held in loops over the wires. When the work is complete the wires are removed, and the remaining loops give a soft pile and make the figured surface of the C. Brussels C.s were introduced into Kidderminster from Tournai in 1745.

Wilton carpet or velvet pile. This is made with longer loops, woven over sharp wires, which, when withdrawn, cut the worsted, leaving a full velvety pile; other wise it is similar in manuf. to Brussels. The C. may afterwards be sheared to even the surface. In recent years many Wilton looms have been erected capable of weaving seamless C.s 12 ft wide or more.

Persian carpets. This manuf. dates from very early times. They are thicker and softer than ordinary C.s, are of great durability, and are renowned for their beautiful designs. They are made by knotting woollen yarn on warp threads, the tufts thus formed being firmly held in place by the woof yarn. Old Persian C.s are highly prized, and are of great value.

Turkey carpets. These are somewhat similar to Persian C.s, being made in the same fashion, but their designs are stiffer and more geometrical in character. The colouring is very rich. The industry flourishes chiefly at Uskah in Asia Minor; C.s of the same kind were formerly made at Axminster (1755-1835), and are still made at Wilton.

Indian carpets, like Persian, are woven by hand, the design being formed by knitting into the warp tufts of woollen threads of the proper colour one after the other. But modern Indian C.s are much inferior to the earlier Indian pile C.s in pattern owing to the debasing influence of W. designs.

Kidderminster carpet. This is made in the greatest quantities in Scotland and Yorkshire, and is the oldest kind of machine-made C. It is made by the intersection of 2 or more cloths of different colours, woven in stripes of different shades. They are made in layers, and are called accordingly 2-ply or 3-ply. The back of the C. is exactly the same pattern as the face-side, but the colours are reversed. There is no pile, the yarn lying flat on the surface, as in worsted cloth.

Axminster carpet. It was first made in England by Thomas Whitley in 1755. It is usually made to order, being made in one piece according to the dimensions of the room for which it is required. They resemble Turkey C.s, and are made in tufts of coloured worsted or wool tied under the warp, the linen threads being rammed down and concealed. As is the case with Turkey C.s, the difficulty lies in changing the colours so as to form the required pattern. In 1839 Mr Templeton of Glasgow patented a method of making *Chenille Axminsters*. The chenille is woven on a separate loom, cut into strips, and bound into tufts, and is then woven into the C., being used as the weft thread. The process of weaving the fur into the C. is performed on a setting loom. Chenille C.s are very popular, partly on account of the variety of colours which can be used, and partly owing to the comparative cheapness. *Royal Axminsters* do not require the chenille to be woven separately; the tufts are cut by machinery and are threaded into the C. by the linen weft. The later types of loom for weaving the fabric can produce a C. 5 yds wide without a seam.

Seats of manufacture. Brussels and velvet-pile C.s are largely made at Kidderminster, and also at Durham and Halifax. Kidderminster C.s come from Kilmarnock and Bannockburn in Scotland, and from Dewsbury and other places in Yorks. Only a small quantity is made in Kidderminster itself. The finest Persian C.s are made at Kurdistan. The patent chenille Axminsters are made to a large extent in Glasgow. In the U.S.A. C.s are chiefly manuf. in Philadelphia, where the first factory was estab. in 1791, and in Lowell. The most famous Fr. C.s are the Savonnerie, made in Paris, and the Aubusson C.s. See PERSIAN ART. See also R. S. Brinton, *Carpets*, 1919; A. F. Kendrick and C. H. C. Tattersall, *Hand-woven Carpets, Oriental and European*, 1922; A. Hackwell, *Die chinesische Teppiche*, 1921; R. Beaumont, *Carpets and Rugs*, 1924; F. J. Mayers, *Carpet Designs and Designing*, 1934.

Carpet-bagger, slang political term for a candidate who stands for election in a locality to which he is a stranger. The term was used contemptuously after the Civil war in the U.S.A. for the N. politicians who, by the help of the Negro vote, controlled the S. administration.

Carpet Bedding, in gardening, the name of a certain formal arrangement of beds, adorned chiefly with bright-coloured foliage-plants or low-growing flowering ones, such as lobelia, cerastium, aubrieta, coleus, sedum, thrift, echeverias, saxifrage, or box, so arranged as to resemble a figured carpet. The patterns are usually geometrical designs, but sometimes birds, butterflies, coats of arms, or other objects are represented. Now only practised in public parks and gardens.

Carpi, Ugo da (1450-1523), It. painter and engraver, claimed to have discovered the art of chiaroscuro printing (see COLOUR PRINTING), but Ger. research would seem to have proved that the art

was practised in Germany in 1499 or before, whereas the earliest of C.'s prints is dated 1518. C. used 3 blocks in his famous engravings after Raphael.

Carpi: 1. It. tn, in Emilia-Romagna (q.v.), 10 m. NNE. of Modena (q.v.). It has a cathedral, and an auct. castle, now a museum. Pop. (tn) 21,100; (com.) 37,600.

2. It. vil., in Veneto (q.v.), on the Adige (q.v.), SE. of Verona. Prince Eugène (q.v.) defeated the French here in 1701.

Carpine, Joannes de Plano (c. 1182-1252), Franciscan traveller, b. Umbria, W. Italy. He was a companion and disciple of St Francis of Assisi and was sent to China by Pope Innocent IV at the head of an embassy to negotiate with the Mongols, and to use his diplomacy to turn them from their avowed intention of devastating Europe. He set out from Lyons in April of 1245, and returned in 1247. Soon after C. was rewarded by the Pope with the bishopric of Antivari in Dalmatia, but it is probable that he did not long survive the hardships of his remarkable journey. He had a genius for recounting his adventures, and Hakluyt pub. portions of his original work; complete text first pub. 1839 as vol. iv of the *Recueil de voyages et de Mémoires* of the Geographical Society of Paris. Ed. for Hakluyt Society by C. R. Beazley, 1913.

Carpineto Romano, It. tn, in Lazio (q.v.), 37 m. SE. of Rome (q.v.). It was the bp. of Pope Leo XIII (q.v.). Pop. 5000.

Carpinio, It. tn, in Apulia (q.v.), 30 m. NE. of Foggia (q.v.). Pop. 6000.

Carpinus, see HORNBEAM.

Carpobalsamum, name given both to the dried fruit and to the oil obtained from the fruit of *Commiphora opobalsamum*, a species of Burseraceae which yields balm of Gilead. The oil is aromatic and volatile, and should be used while fresh or it becomes inert.

Carpocrates, or **Carpocoras**, Alexandrian gnostic philosopher, probably of Hadrian's reign (AD 117-38). He founded the sect of Carpoctratians, who existed as late as the 6th cent. They were avowed eclectics, taught that Christ was a human being of pre-eminent goodness, and that the world was created by angels. The Supreme Deity was the Monas. They believed in pre-existence of the soul, and worshipped Zoroaster, Pythagoras, Plato, and others, as well as Christ, as benefactors of mankind.

Carpology (Gk *karpōs*, fruit; *logos*, word), name given to the div. of botany which comprehends all that relates to the structure of the fruit (q.v.).

Carpophore (Gk *karpōs*, fruit; *pherein*, to bear), botanical term used to indicate the prolonged axis of a flower which passes up between the carpels to the top, and which serves to attach the carpels to the plant when they have split apart, e.g. in a silique. Examples occur in the Umbelliferae, Geraniaceae, and Rosaceae.

Carpus (Gk *karpōs*, wrist), in anatomy, the series of bones between the forearm

and hand. In man there are 8 small bones in 2 irregular rows of 4. The upper row articulates with the radius, the lower with the metacarpal bones of the hand. Rudiments of carpal bones are found in all mammals.

Carpov, Benedikt (1595-1666), Ger. jurisconsult, son of Benedikt C. (d. 1624), Privy Councillor to the Elector of Saxony, and author of *Practica nova Imperialis Saxonica rerum criminalium*, 1635, *Definitiones forenses*, 1668, and other works.

Carr, see SOMERSET, EARL OF.

Carr, Herbert William (1857-1931), philosophical writer. Educ. at King's College, London Univ., and became prof. of philosophy there. Pubs.: *The Problem of Truth*, 1912; *Henri Bergson*, 1912; *The Principle of Relativity*, 1920; *Genlil's Theory of Mind as Pure Act*, 1921; *The Scientific Approach to Philosophy*, 1924; *Changing Backwards in Religion and Ethics*, 1927.

Carr, John (1723-1807), architect. b. Horbury, Yorks, made his reputation as a designer of country mansions in the Palladian style. These included Harewood House (subsequently altered by R. Adam, q.v.), with its model vil.; Denton Park; Gledstone Hall; Heath Hall; Constable Burton; Kirkleatham Hall—all in Yorks; and Basilston Park, Berks. His other buildings included the Asylum, Assize Courts, and sev. houses in York; the Crescent at Buxton; tn halls at Newark and Chesterfield; and Horbury Parish Church (at his own expense). Though of humble birth, he was twice Lord Mayor of York, and left £150,000 at his death.

Carr, John Dickson (1905-), Amer. writer of detective stories, b. Uniontown, Pennsylvania. He studied law, but turned to journalism and then became well known as a writer of ingenious detective stories, which include *The Crooked Hinge*, 1938, *The Case of the Constant Suicides*, 1941, *The Sleeping Sphinx*, 1947, *Death Watch*, 1953, and many others. He also pub. a life of Conan Doyle in 1949, and with Adrian C. Doyle wrote *The Exploits of Sherlock Holmes* in an attempt to resuscitate the great detective. He also wrote a number of crime mysteries under the name of Carter Dickson, including *The Ten Teacups*, 1937, *The Judas Window*, 1938, *And So to Murder*, 1940, and *The Gilded Man*, 1942.

Carr, Joseph William Comyns (1849-1916), art critic and dramatist; educ. at London Univ. He was one of the editors of the *Academy*. He became Eng. editor of *L'Art*, 1875. He was director and one of the founders of the New Gallery, Regent St, where many of Burne-Jones's works were first exhibited. Among his pubs. are *Drawings by the Old Masters*, 1877, *Examples of Contemporary Art*, 1878, *Essays on Art*, 1879, *Papers on Art*, 1883-4, and *Modern Landscape*. C. also wrote *A Fireside Hamlet*; *The United Pair*, *Forgiveness*, *King Arthur*, *Some Eminent Victorians*, and adapted various novels for the stage.

Carraca, La, see CÁDIZ.

Carracci, see **CARACCI**.

Carrageen Moss, otherwise known as **Irish or Sea Moss**, edible seaweed technically called *Chondrus crispus*, found on rocky shores of N. Europe and N. America. It is reddish-brown in colour, 2 to 12 in. long and repeatedly forked. It is bleached and dried to be sold. It may be boiled in milk as a health drink, or used for jellies. It is also used for making size and absorbent surgical dressings, stuffing mattresses, and feeding cattle. See **SEAWEED**.



CARRAGEEN MOSS

Carrantuohill (3414 ft), highest mt in Ireland, ascent from Gortube School or Lough Acoose. It is one of the Macgillivuddy Reeks (q.v.) in co. Kerry (q.v.).

Carranza, Bartolomé (de Miranda) (1503-76), Sp. priest, b. Navarre. He entered the Dominican order, and became prof. of theology at Valladolid. Charles V sent him to the Council of Trent. He accompanied Philip II to England, and became Queen Mary's confessor, working zealously to establish Catholicism. Chosen Archbishop of Toledo in 1557, he was accused of heresy by the Inquisition, nominally owing to his *Comentarios sobre el Catechismo Cristiano*, 1558, and spent the rest of his life in prison.

Carranza, Venustiano (1859-1920), President of Mexico, b. Cuatro Ciénegas, in the state of Coahuila, and educ. in Mexico City. In early life he cultivated his extensive farms in Coahuila. He made sev. attempts to enter Parliament, but was defeated through the efforts of President Díaz. In 1911 he sided with the revolutionary president Madero—to whom, however, he was not believed to be loyal. He was, under Madero, elected governor of Coahuila. When, after the murder of Madero, the presidency was seized by Huerta, in 1913, C. declared war against Huerta. In Aug. 1914 C. obtained the surrender of the administration; and in Oct. 1915 was recognised as President by the U.S.A. He was not formally elected, however, until the end of 1916. Another revolution broke out

in 1920; C. was defeated, captured, and shot 5 days later at Tlaxcalatongo in the state of Puebla.

Carrara, It. tn, in Tuscany (q.v.), at the foot of the Apennines (q.v.), 4 m. NNW. of Massa (q.v.). It has a Romanesque-Gothic cathedral (12th-14th cents.), and is famous for its marble quarries, which have been worked for over 2000 years. The marble used for sculpture is peculiarly white and flawless and of great durability, but few of the more than 400 quarries produce this variety. Nearly all the surrounding heights (Monte Sagro, 5684 ft) are of marble, and mt railways serve the quarries. The tn has an Academy of Fine Arts, founded in 1769. Marina di C., 3 m. SW. on the Ligurian Sea, is a port and bathing resort. Pop.: (tn), 27,200; (com.), 62,800.

Carrel, Alexis (1873-1944), Fr. doctor of medicine, b. Sainte Foy-les-Lyon, France. After studying medicine for a time when quite a youth and becoming a member of the Lyons Univ., went to the U.S.A., where he became connected with the Univ. of Chicago. In 1909 he was elected an associate member of the Rockefeller Institute for Medical Research. In 1912 he was awarded the Nobel prize (amounting to £7800) for medicine on account of his brilliant success in suturing of blood vessels and in transplantation of human organs. He conducted some remarkable experiments in 1913 on cats, keeping vital organs alive for some hours after their removal from the body. At the outbreak of war he returned to France, and became famous as the chief inventor of the C. Dakin treatment of wounds by irrigation—very part of the wound being repeatedly sterilised with a solution chiefly of hypochloride of sodium, applied through a system of rubber tubes. In 1919 he returned to the Rockefeller Institute and continued his work there until his retirement in 1939. In the following year he returned to France, and was placed by the Vichy Gov. in charge of the Foundation for the Study of Human Relations, where he remained until the liberation of France in 1944. Charges made against him of collaboration with the Germans were denied. There was no trial and C. d. the same year on 5 Nov. See Sir Wm Macpherson (ed.), *Official Medical History of the War, 1921-4*.

Carrer, Luigi (1801-50), It. lyric poet and scholar, native of Venice. He gave up the law for literature, becoming prof. of philosophy at Padua, 1830; later, director of the Correr Museum, Venice. His poems, which reveal the influence of Foscolo and Byron, included idylls, epigrams, sonnets, hymns, and tragedies, but the best are ballads (introduced from Germany) and odes. His *L'anello di sette gemme*, 1838, told in poetical form the hist. and customs of Venice. Vols. of poems and ballads appeared in 1832, 1838, and 1841; prose and poetry, 1837; and odes and sonnets in 1868. See lives by Veludo, 1851, Venanzio, 1855, and Satorio, L. *Carrer*, 1900.

Carrhae, anct. city of Mesopotamia, about 25 m. from Edessa, the Haran of

the Bible and Assyrian inscriptions. The crushing defeat of Crassus by the Parthians in 53 bc, when the Rom. standards were lost, is frequently mentioned in classical literature.

Carriacou, is. of the Brit. W. Indies and the largest of the Grenadines, being 8 m. long, and from 2 to 4½ m. wide. Cotton is grown. Hillsborough, on the W. coast, is the tn and harbour. C. elects a member to the legislative council of Grenada. Pop. 3000.

Carriage (Lat. *carrus*, car, chariot, wagon), a means of carrying; any vehicle intended to convey goods, but especially passengers, by road or rail. Hence railway 'C.', hackney C., gun C., and various other compounds. C.s are structures on 2 or more wheels, and vary greatly in size and shape. Possibly they were first developed from the Egyptian sledges and rollers used for conveying heavy loads. Chariots were known also to the anc. Israelites, Greeks, and Romans, chariot racing being a favourite sport at the public games of Greece and Rome. The covered C. of to-day dates from about the 15th cent. In 1555 the first Eng. C. (excluding the war-chariots of the anc. Britons) was made by Ripon for the Earl of Rutland. By the 17th cent. they were much used, and ousted the sedan-chair, being themselves replaced by the cab in 1820. The hansom cab was introduced in London in 1834 by Joseph Hansom. Other 2-wheeled C.s are the stanhope, tilbury, gig, and dog-cart. In the 18th cent. many improvements were made; the body was suspended on straps, attached later to 'C'-shaped springs. The use of the private 4-wheeled C. drawn by one or more horses (often the 'C. and pair,' with 2 horses) was especially marked during the Victorian era. The brougham was introduced in 1839, other types being the landau, victoria, and four-in-hand. Open 4-wheeled C.s are the phaeton, wagonette, and brake. The drag and the omnibus have seats both outside and in. C.s have various different special names in different parts of the world, but the word is commonly used in England of the 4-wheeled, private, horse-drawn vehicle. See also CAB; CART; COACH AND COACHING. See H. McCausland, *The English Carriage*, 1948.

Carriage-building, see COACH-BUILDING.

Carriage Dog, see DALMATIAN DOG.

Carriage Licences, see MOTOR VEHICLE LICENCES.

Carrick, Thomas Heathfield (1802-75), miniaturist, b. near Carlisle, educ. at the grammar school there; a self-taught artist. He neglected his chemist's business for painting. In 1836 he moved to Newcastle; 1839 to London. From 1841 to 1866 he exhibited annually 8 miniatures. Among the most famous are those of Carlyle, Sir R. Peel, Rogers, Wordsworth, Longfellow, Charles Kean, Farren, Macready, Daniel O'Connell, and Robert Owen. In 1845 he was awarded a medal for his method of painting miniatures on marble; and a Turner annuity by the Royal Academy about 1868. See Royal Academy catalogues, 1841-66.

Carrick-on-Shannon, riv. port and co. tn of Leitrim co., Rep. of Ireland, on the R. Shannon, 37 m. S.E. of Sligo. There is trade in shipping, dairy produce, corn, and plastic electrical fittings. Pop. 1500.

Carrick-on-Suir, tn in co. Tipperary, Rep. of Ireland, connected with Carrickbeg, in co. Waterford, by 2 bridges over the Suir. It has an anc. castle and par. church. Tanning is the chief industry. Pop. 4800.

Carrickfergus, seaport tn. in co. Antrim, N. Ireland, on Belfast Lough. William III landed here before the battle of the Boyne. The castle of C., dating back to the 12th cent., is preserved as an anc. monument, and the par. church, the oldest still in use in Ulster, is of the same period. Salt and rayon are the chief industries, and wrought iron is a local handicraft. Pop. 9500.

Carrickmacross, mkt tn in the co. of Monaghan, Rep. of Ireland, with manufs. of leather and boots, industrial alcohol, mineral waters, a trade in grain, and a fruit processing industry. It is renowned for the manuf. of lace. Pop. 2100.

Carrier, Jean-Baptiste (1756-94), Fr. revolutionary, b. Yvetot. He was a lawyer. Elected to the Convention, 1792, he helped to form the Revolutionary Tribunal, voted for the death of the king, demanded the arrest of the Duke of Orleans, and helped in overthrowing the Girondists. C. was sent to Nantes, 1793, to repress the civil war started by priests and Royalists in La Vendée. He massacred over 16,000 Vendean and other prisoners without trial, sparing neither women nor children. After Robespierre's fall he was guillotined.

Carrier (Disease Carrier), in medicine a person who, recovered from an infectious disease, retains the germ for varying periods of time and is, therefore, capable of spreading the infection; notably in the case of typhoid, paratyphoid, cholera, and dysentery, diphtheria, scarlet fever, infantile paralysis, and meningitis. The germs are carried in the faeces, urine, throat, tonsils, and nose.

Carrier, Common, in Eng. law, one who undertakes for hire to carry goods or passengers from one place to another either by land or water. He is distinguished from the private C. by being ready to accommodate the public generally and has different responsibilities in law. Examples of land C.s are omnibus companies, railway companies, wagoners, firms such as Carter Paterson & Pickford and others; C.s by water are owners of steamships, ferry-boats, and the like. Up to 1933 the carriage of goods by road was uncontrolled and the Road and Rail Traffic Act of that year was passed as a result of a widespread feeling that the fierce and cut-throat competition in the industry which developed during the years following the First World War was becoming dangerous. This Act (which took effect as from 1934) imposed a measure of control by making it necessary for any person carrying goods for hire or reward to have a licence to do so, and to operate subject to specified

conditions and in certain cases within defined limits. Since 1934 no person may use a goods vehicle on a road for the carriage of goods for hire or reward, or for or in connection with any trade or business carried on by him, except under a licence. Licences are of 3 classes (*see* BRITISH TRANSPORT COMMISSION). The 'A' licence applies to the common C. or public C., and it entitles the holder to use his vehicle for the carriage of goods for hire or reward, but not for the carriage of goods in connection with any trade or business carried on by him except that of a C. of goods. It is a condition of the licence that the vehicles are maintained in a fit and serviceable condition; speed limits and regulations as to loading are complied with; requirements as to drivers' hours are observed; and that records of work, journeys, and loads are kept (Sect. 8 (1)). Under the Transport Act, 1947, it shall be a condition of every licence that, except under a permit granted by the Brit. Transport Commission, goods shall not be carried for hire or reward in any authorised vehicle if the vehicle, at any time while the goods are being so carried, is more than 25 m. from its operating centre, and the Road and Rail Traffic Act, 1933, shall have effect as if the said condition were included among the conditions specified in subsection 1 of section 8 of the Act. But this additional condition is not applicable where the goods carried are liquids carried in bulk in a tank permanently fixed to the vehicle, or in a tank not so fixed of which the capacity is not less than 500 gallons, or are goods of a special character which under any statutory provision may only be carried in a specially constructed vehicle, or where the carriage is an ordinary furniture removal, or the goods carried are meat or livestock; or the goods consist of felled timber carried in a specially constructed carriage. The general effect of this clause (52 of the Act of 1947) is that goods vehicles used under licence are not allowed to carry goods for reward more than 25 m. (measured as air miles) from their base, and that this becomes an additional condition of the licence.

A common C. of goods must transport any except specially dangerous articles to the place to which he professes to carry goods. A fixed rate of payment must be charged to all employers alike, payment being made beforehand if desired. Otherwise the C. has a lien on the goods taken for his charges. He is in the eyes of the law responsible for all acts of his employees. Also, unless his liability be limited by a special contract, he is responsible for all goods entrusted to him until they have been delivered, and must make good any loss or damage occurring through any cause except 'the act of God, or the public enemy' (in the narrowest signification). These stringent rules exist to guard the interests of employers, and prevent their being entirely at the mercy of the C. If goods are to be warehoused with C.s for a time previous to carriage, extraordinary liability is not incurred by

them until the actual time of carriage, though of course ordinary care and precautions must be taken. In England if a number of C.s are engaged in the transfer of goods, the first is held liable, as insurer, as being the party with whom the contract was originally made. Personal delivery is expected of land C.s. Water C.s can only take goods to the wharf, but notice must be given of the vessel's arrival and discharge of cargo. A special contract may be entered upon for the carriage of goods, but no C. can exempt himself from liability for goods not mentioned in the Carriers Act by a mere printed notice that he refuses to hold himself responsible. A definite contract signed by the employer is essential before the C. can shake off his responsibilities as insurer. The Carriers Act of 1830 granted certain exemptions from liability to common C.s by land. A ship owner's liabilities are much the same, except as limited by the Merchant Shipping Acts, and by the contract of affreightment. At common law railways are common C.s only of such goods as they profess to carry. But as regards other goods, etc., their liability for neglect or default is dealt with by the Railway and Canal Traffic Act, 1854, and amending Acts. A railway is a common C. of a passenger's personal luggage and therefore an insurer of its safety; but this is not so if the luggage has been taken by the passenger out of the control of the railway. Hence in the event of accidents the railway is only liable if negligence can be proved. By the Railway and Canal Traffic Act of 1854 liability as to animals was limited. Railways are not common C.s of the passengers they carry and therefore are not 'insurers' of their safety. Passenger C.s are not responsible for mishaps caused by the passenger's contributory negligence. They must accept as passengers all who comply with their rules (as to tickets, use of cars, etc.), except people of disorderly behaviour or those who have some contagious disease. *See* Carver, *Law of Carriage of Goods by Sea* (10th ed.), 1956; O. Kahn-Freund, *Law of Carriage by Inland Transport* (3rd ed.), 1956.

American Railways. There is a vital difference in the Amer. law as to common C.s, railways being considered common C.s of passengers, with the consequence that they are sued almost every day for accidents in which passengers are injured.

Carrier-current, or Carrier-wave, alternating current of a given frequency on which one or more high-frequency currents are superposed at the sending end, being filtered out from the carrier at the receiving end. Sometimes the power current on high voltage transmission lines is used as carrier for signals or internal telecommunication. *See* TELEPHONY.

Carrier Pigeon, variety of the family Columbidae, remarkable for the huge white wattle round the eyes and at the base of the beak. It is essentially a fancy bird, and the messenger pigeon proper is called the homer.

Carrière, Eugène Anatole (1840-1906),

Fr. genre painter, b. Gournay-sur-Marne, lived in Paris. He was a pupil of Cabanel, and was awarded a medal, third class, 1885. Edmond de Goncourt called him 'the modern Madonna painter,' for his frequent treatment of this subject. His famous 'Maternity' (1892) was bought by the Luxembourg. His portraits of Daudet, Edmond de Goncourt, Anatole France, Metchnikov, show ability to depict character, though his manner of painting was vague and melting. There is a decorative panel at the Sorbonne by C. (1898), and in the Hôtel de Ville, Paris. See G. Geoffroy, *L'Œuvre d'Eugène Carrière*, 1902.

Carrière, Moritz (1817-95), Ger. philosopher and writer on aesthetics; studied at Giessen, Göttingen, Berlin, and in Italy; prof of philosophy at Giessen, 1849; secretary and prof. of anc. hist. at the Academy of Plastic Arts at Munich, 1853. At first a Hegelian, he later followed the system of Fichte more closely. He also ranked high as an art critic. Among his works are a treatise, *Aristotle the Friend of Plato* (in Latin), 1837, *Die Religion in ihrem Begriff*, 1841, *Die philosophische Weltanschauung der Reformationszeit*, 1847, *Die letzte Nacht der Girondisten* (a poem), 1849, *Das Wesen und die Formen der Poesie*, 1854, *Ästhetik*, 1859, *Die Kunst im Zusammenhang der Kultur-entwicklung*, 1887, and *Lebenserinnerungen* (ed. W. Djehl), 1914. See *Gesammelte Werke* (14 vols.), 1886-94.

Carrington, C. R. Wynn-C., see LINCOLNSHIRE, MARQUESS OF.

Carrington, Sir Frederick, Major-General (1844-1913), soldier, educ. at Cheltenham College, entered the army, 1864. He commanded the Light Horse in the Transkei war, 1877; led the colonial forces against the Sekukuni in the Transvaal, 1878-9; and in the Basuto war, 1881. Commandant of Bechuanaland police, 1893; K.C.B., 1897. In the S. African war (1899-1902) he commanded the Rhodesian field force, helping to raise the siege of Mafeking, 1900.

Carrington, Henry Beebe (1824-1912), Amer. soldier and military historian, b. Connecticut, graduated Yale, 1845, studied law at Yale Law School, 1847. In 1869 prof. of military science in Wabash College. Among his many works are *Russia as a Nation*, 1849, *History of the Battles of the American Revolution*, 1876, and *The Washington Obelisk and its Voices*, 1887.

Carrington, Richard Christopher (1826-1875), astronomer, b. Chelsea, educ. Cambridge; from 1849 to 1852 observer at Durham Univ. After 1852 he conducted observations (especially of the minor planets, fixed stars, and the sun), at his private observatory at Redhill, Surrey. He showed that the period of rotation of sunspots varied with their lat. on the sun. Secretary of Royal Astronomical Society, 1857-62; F.R.S., 1860. He pub. *Catalogue of 3735 Circumpolar Stars*, 1857, and *Observations of the Spots on the Sun*, 1863, which greatly influenced the study of solar physics.

Carrión Crow (*Corvus corone*), Brit. species of Corvidae, closely connected with *C. cornix*, the hooded crow. In S. America and the U.S.A. the name is given to *Catharista atrata*, the black vulture, a species of Cathartidae which greatly resembles the turkey-buzzard. The colour of this bird is black, and its naked head is also dark of hue. Both species act as scavengers, but the former will also attack young living animals.

Carrión Flowers are those which attract short-tongued flies by means of their moat-like appearance or their foetid smell and so become pollinated. Two such species are *Amorphophallus titanum* and *Arum maculatum*, both belonging to the family Araceae. They both emit a very disagreeable odour, and the former is of a red and yellow colour, which serves as an additional attraction. The genus *Slapelia*, which belongs to the Asclepiadaceae, has the same property to induce flies to fertilise its flowers, and the flowers themselves are of a dark red colour.

Carroccio, large war-chariot drawn by oxen, used by the medieval reps. of Italy to carry their banner into battle. On a rectangular platform, painted red, were set the city's standard and an altar, at which mass was said before battle. It was surrounded by the bravest soldiers in the army, and regarded both as a rallying point and as the palladium of the city's honour.

Carroll, Charles, of Carrollton (1737-1832), Amer. patriot, b. Maryland; educ. at Jesuit colleges of Saint-Omer, Rheims, and Louis le Grand; studied law in Paris and London. He returned to America, 1765, inheriting a large estate. He was a member of the Committee of Observation, 1775, and elected delegate to the Prov. Convention. In 1776 C. was sent to persuade the Canadians to war against England, and was delegate to Congress. He was the last surviving signer of the Declaration of Independence. In 1789 U.S. senator for Maryland; 1799, member of the Maryland and Virginia boundary commission. In 1810 he retired from public life. See biographies by K. M. Rowland, 1898; Joseph Gurn, 1932; Ellen Hart Smith, 1942; and L. A. Leonard, *Life of Charles Carroll of Carrollton*, 1918.

Carroll, John (1735-1815), Amer. Rom. Catholic prelate, cousin of above, b. Prince George's co., Maryland; educ. in Flanders; entered the Society of Jesus in 1753; became a priest in 1769, and a professed father in 1771. He returned to Maryland in 1774, and took a prominent part in Amer. politics. Estab. and endowed through his influence Georgetown Univ. (completed 1791). He was consecrated a bishop in 1790, and became archbishop in 1811; as a staunch Federalist he opposed the war of 1812.

Carroll, Lewis, pen-name of Charles Lutwidge Dodgson (1832-98), mathematician and author, b. Daresbury, Cheshire. Educ. at Rugby and Oxford, he took a first in mathematics, 1854; took orders, 1861; and was mathematical lecturer at Christ Church, 1855-81. He

lived a retired life at Oxford, but delighted in the company of little girls. A few of his witty pamphlets on univ. affairs were collected and pub. as *Notes by an Oxford Chiel*, 1865-74. His mathematical speculations were intricate and ingenious. Among such pubbs., under the name of C. L. Dodgson, are *A Syllabus of Plane Algebraical Geometry*, 1860, *Guide to the Mathematical Student*, *Elementary Treatise on Determinants*, 1867, *Euclid and his Modern Rivals*, 1879-85, and *Curiosa Mathematica*, 1888, 1894. But his fame rests chiefly on *Alice's Adventures in Wonderland*, 1865 (the first version of which was *Alice's Adventures Underground*, a MS. which Dodgson gave to Mrs Reginald Hargreaves, d. 1934, who was then Alice Pleasance Liddell, daughter of the dean of Christ Church, Oxford, and the original of Alice); and on its continuation, *Through the Looking-glass*, 1872, both illustrated by Tenniel. These books are still the delight of children and grown-ups alike. They are full of whimsical fancies, grotesque absurdities, and unforgettable remarks and incidents. Though occasionally plagiarised, they are inimitable; and have become widely read classics, having been trans. into various tongues. The first dramatised version appeared in London, 1886, but the play of necessity loses much of the charm of the book. In 1928 the MS. of *Alice in Wonderland* was sold to Dr Rosenbach, an Amer. dealer, for \$15,000, and later in the same year resold to Mr R. E. Johnson of New Jersey for \$150,000, or £30,000. Later Dr Luther H. Evans, librarian of Congress, paid \$50,000 (£12,500) for the vol. at an auction and in 1948 presented the MS. and C.'s own drawings to the Brit. Museum 'as a gift from America to the Brit. people.' A centenary exhibition of C.'s works, portraits, etc., was held in London, 1932. The sole available copy in England of the first version of *Alice in Wonderland* was that owned by Sir Leicester Harmsworth, who also possessed a copy of a skit called *American Telegrams*, only one other copy of which is extant. C.'s other works are *Phantasmagoria and other Poems*, 1869; *The Hunting of the Snark* (humorous verse), 1876; *Doublets, a Word Puzzle*, 1879; *Rhyme? and Reason?*, 1883; *Principles of Parliamentary Representation*, 1884; *A Tangled Tale*, 1885; *The Game of Logic*, 1887; *Sylvie and Bruno* (illustrated by H. Furniss), 1889; *Symbolic Logic* 1886; his *Diaries* were ed. by R. L. Green, 1954. See S. D. Collingwood, *Life and Letters of Lewis Carroll*, 1898; I. Bowman, *The Story of Lewis Carroll told for Young People by the Real Alice*, 1899; and studies by W. de la Mare, 1932; L. Reed, 1932; F. B. Lennon, 1947; D. Hudson, 1954.

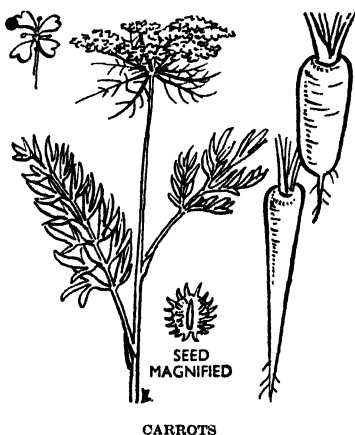
Carrollton, formerly a post-vil. of Jefferson par., Louisiana, on Mississippi R., now suburb of New Orleans, U.S.A.

Carron, vil. near Falkirk in Stirling-shire, Scotland, on the R. C., celebrated for its old-estab. ironworks, founded in 1759. Carronades and other guns were made here until 1852, when more modern

armaments superseded them. Now an extensive manuf. of stoves, grates, boilers, and cast-iron goods, including intricate and specialised castings, is carried on, which supports a large part of the pop. Pop. 3200.

Carron Oil, limewater and linseed oil mixed in equal proportions, as a dressing for burns. The name is derived from the C. foundry in Scotland, where, from its frequent use in the ironworks, its reputation was made. It is a soapy, thick mixture, and in modern practice has been replaced by neater dressings, such as a solution of bicarbonate of soda and a thin smearing of vaseline, or oxide of zinc ointment, or, more usually, a saline dressing at first followed by one of the antibiotics.

Carronades, short cast-iron guns, attached to the carriage by loop and bolt instead of trunnions, were invented in 1752 by Gen. Robert Melville, and made at Carron by Gascoigne for use in the navy. The metal was not so thick as that of most guns of the same calibre, and the powder chamber was at the muzzle, as in mortars. Only small charges of powder could be used, and they were of short range. Smaller long-range guns have rendered them obsolete.



Carrot, plant of the genus *Daucus* and family Umbelliferae. The common C. (*Daucus carota*), originally a native of the E., has been naturalised in Europe and America, and is a biennial plant. In E. U.S.A. it is often a pernicious weed. The root of the cultivated variety is much thicker and pleasanter in taste than that of the wild. The leaves are pinnately compound, the flowers creamy-white to pink or purplish in the central ones. The foliage is beautiful for decorative purposes and in Charles I's reign ladies sometimes even wore the leaves instead of feathers. Introduced into England early in the 16th cent., it forms an article of food both

for cattle and for man. The roots are also used for poultices. C.s contain colouring matter used in some parts of Britain to colour butter. The white Belgian C. gives the largest crops. It has a thick white root, pale green above the earth. These are inferior to the red varieties for nutritive purposes. A deep, sandy soil, well drained and deeply trenched, suits best. It should be prepared and manured in autumn. The main crop is sown from late Mar. to April. The plants must be thinned out after sowing and kept free from weeds. During the winter the roots may be stored in a cellar or shed. Long-rooted kinds need about 3 ft. of soil; short horn varieties thrive in 6 in. of good compost on top of poorer soil.

Carrum, popular seaside resort in Victoria, Australia, 22 m. from Melbourne.

Carruthers, Robert (1799-1878), journalist and miscellaneous writer, b. Dumfries. In his youth he was apprenticed to a bookseller, becoming editor of the *Inverness Courier*, 1828, and proprietor, 1831. He collaborated with Robert Chambers to produce the *Cyclopaedia of English Literature*, 1843-4.

Carruthers, William (1830-1922), botanist. Educ. for the Presbyterian Church, he took up botany instead, becoming assistant in the botanical dept. of the Brit. Museum in 1859 and keeper in 1871. He was the pioneer in this country of seed testing, especially of pasture grasses. He wrote many papers on systematic, palaeontological, and agric. botany.

Carse, Scottish term for low, alluvial lands adjoining rivers, examples being the C. of Gowrie, C. of Falkirk, C. of Stirling. C. soils are usually very fertile, consisting of argillaceous deposits, but sometimes they are barren clays.

Carse of Gowrie, fertile dist. of Scotland, extending some 15 m. between the Tay and the Sidlaw Hills in Perthshire and Angus.

Carsebreck, loch in Perthshire, the great Scottish curling (q.v.) centre, 11 m. by rail from Stirling.

Carshalton, urb. dist. of Surrey, England, 3 m. from Croydon, and 11 m. S. of London. Has an old church, some fine old houses, and over 300 ac. of public park; but it is chiefly a residential dist. Pop. 62,800.

Carso, see KARST.

Carso Plateau, situated on the Gulf of Trieste, was the scene of fighting between the Austrians and the Italians during the First World War. The first campaign in this area commenced in Sept. 1916, when the Italians under Cadorna succeeded in capturing the heights at San Grado and other important positions. Further Italian progress on the C.P. was made in Nov. 1916. The road to Trieste was, however, blocked by the Austrian strong positions on Mt. Hermada, and in the spring of 1917 plans were made for capturing these. In the middle of May operations commenced and much progress was made in the sector S. of Gorizia. After a lull fighting began again in Aug. 1917, but, though yet further progress was made on the C.P., the It.

debacle of Caporetto (q.v.) caused their forces on the C. P. to retreat hurriedly and no further fighting took place in this theatre.

Carsoli (anot Carsoli), It. tn. in Abruzzi e Molise (q.v.), 23 m. SW. of L'Aquila (q.v.). The Palazzetto Orsini was destroyed in the Second World War, together with the medieval houses fronting the square. There is a trade in wine. Pop. 7500.

Carson, Christopher (1809-68), familiarly known as 'Kit' C., Amer. trapper, guide, and soldier. He emigrated from Kentucky to Missouri as a hunter and trapper. His knowledge of Indian languages and habits made him excellent as a guide in Frémont's Rocky Mts. explorations, 1842-5. C. served under Frémont during the conquest of California, 1846-7, and settled in New Mexico, 1853, becoming U.S. Indian agent at Taos. For his services in the Civil war he was breveted brigadier-general. He d. at Fort Lynn, Colorado. He figures in Willa Cather's *Death Comes to the Archbishop*. See lives by De Witt C. Peters, 1858; E. S. Ellis, 1899; S. Vestal, 1928, and B. C. Grant (editor), *Kit Carson's Own Story of his Life*, 1926.



LORD CARSON

Carson, Edward Henry, Baron (1854-1935), educ. at Portarlington School and Trinity College, Dublin. He represented Dublin Univ. in Parliament as a Conservative, 1892-1918; then sat for Duncairn div. of Belfast, 1918-21. In 1894 he was appointed queen's counsel at the Eng. Bar, having held that office at the Irish Bar since 1889. Having acted as solicitor-general for Ireland in 1892, he was knighted, and became solicitor-general in 1900, retaining the position till 1906. He led the Unionist campaign against the Parliament Act; and in 1912 he successfully engineered the signing of the

covenant by which, at Belfast, thousands bound themselves to refuse to recognise any Home Rule Parliament. The Ulster Unionist council became, in the latter part of 1913, a provisional gov., and C. was its head. During the First World War C. joined the coalition gov. in June 1915 as attorney-general, but resigned in Oct. as he disagreed with Grey's policy in the Balkans. Under Lloyd George C. was first lord of the Admiralty from 1916, and he supported the Irish Convention of 1917, in which year he quitted the Admiralty, but remained in gov. as a member of the War Cabinet. At the close of the war he agreed to dividing N.E. Ireland from the rest of the country. Of commanding presence and magnetic appearance, C. was one of the most formidable orators of his day. He was given a life peerage, 1921, and became a lord of appeal. See *Life* (2 vols.) by E. Marjoribanks and I. Colvin, 1932, and 1934.

Carson, Rachel Louise (1907-), Amer. writer on science, b. Springdale, Pennsylvania. Educ. at Pennsylvania College for Women and Johns Hopkins Univ., she joined the staff of the *univ.* of Maryland. Her best-known book is *The Sea Around Us*, 1951. She has received numerous awards for her scientific work.

Carson City, cap. of Nevada, U.S.A., and the co. tn of Ormsby co., 24 m. S. of Reno. It is a rail and trade centre and resort in a silver-mining and agric. area; cattle are slaughtered and there is a brewing industry. Pop. 3082.

Carstairs, par. of S. Lanarkshire, Scotland, 3½ m. ENE. of Lanark, with an important railway junction. Pop. 2623.

Carstairs, William (1649-1715), minister, son of a minister of Cathcart, near Glasgow, who had been taken prisoner at the battle of Dunbar by Cromwell and exchanged. He was educ. at the college of Edinburgh, and in Holland, where he studied under the most celebrated profs., and was probably ordained in the Dutch Church. He also made the acquaintance of William of Orange, and became his confidential adviser. In 1672 he came to London and was arrested by Lauderdale on petty charges of creating disturbances. Nothing was proved against him, and he was kept a prisoner in Edinburgh Castle for 5 years. He returned to Holland, and from there made frequent visits of investigation, acting as agent between Eng. and Scottish conspirators, in conjunction with Shaftesbury, Russell, and Argyll. After the Rye House Plot (q.v.), which he really did not uphold, he was arrested and again imprisoned, and on his release he sought security in Holland, where he became chaplain to William of Orange. In reconciling the Scottish Church his influence was invaluable, his advice having the greatest possible weight with William. Under Anne he was elected principal of Edinburgh Univ. and presented with a living.

Carstens, Asmus Jakob (1754-98), Ger. artist, b. near Schleswig. He was apprenticed to a wine merchant for 5 years, but at the age of 22 he went to Copenhagen to

study art. Then followed a period of great poverty in Lübeck and Berlin, during which he barely supported himself by portrait-painting. He was released from penury by the success of his large composition 'The Fall of the Angels', which contains 200 figures, and which gained for him the patronage of the court, a professorship at the Berlin Academy, and a pension. He visited Rome in order to study the works of Michelangelo and Raphael, and gained a passion for the antique. This 'classicism' had much effect on Ger. art. His numerous drawings represent chiefly subjects from the anc. classic poets and from Ossian and Shakespeare. He d. at Rome in extreme poverty.

Carswell, Catherine Roxburgh (1879-1946), critic and novelist, b. Glasgow. Her maiden name was Macfarlane, and she was educ. at the Park School and Glasgow Univ. In 1915 she married Donald Carswell, also a writer, who was killed in an accident in 1940. Her first novel, *Open the Door*, 1920, was followed by *The Camomile*, 1922. In 1930 she pub. a 'debunking' *Life of Burns*, and in 1932 *The Savage Pilgrimage: a Narrative of D. H. Lawrence*, which was suppressed as libellous. Her autobiography, *Lying Awake*, was pub. in 1950.

Cart (probably from Old Norse *kartr*, or O.E. *craet*, of doubtful meaning), term for various kinds of vehicle, strictly 2-wheeled, topless and springless, usually designed to carry heavy loads and to be drawn by 1 horse. It is the most primitive form of carriage or chariot (q.v.). C.s are generally for agric. or postal purposes, for transport of goods or luggage (farmer's C., tradesman's C., carrier's C.). Combined with other words it may denote special kinds of pleasure-carriages now largely of historical interest. Examples are the dog-C. (originally made for the conveyance of sporting dogs), a rather high, 2-wheeled carriage with seats back to back, in front and behind. These are particularly suited for tandem driving. The gadabout is a dog-C.; the Whitechapel C. and the gig (stanhopes and tilburies included) are other varieties. The governess C. is a very low, 2-wheeled pony-carriage with 2 side seats facing inwards. Other 2-wheeled C.s are the Irish jaunting car, the Canadian calash, and the Amer. trotting sulky.

Cartagena (anc. Carthago Nova—New Carthage), Sp. fortified seaport and naval station in the prov. of Murcia, built on a bay of the Mediterranean. Founded by Hasdrubal (q.v.), it became the chief tn of the Carthaginians in Spain. In 210 BC it was taken by Scipio Africanus Major (q.v.), and because of its neighbouring mines—in which they employed 40,000 men—was a tn of great importance to the Romans. It was sacked by the Vandals, and was, later, an independent principality under the Moors. In 1588 it was pillaged by Drake, was taken by the Duke of Berwick in 1707, and formed itself into an independent canton for a time in 1873. As the naval base of the republicans, it

was bombed during the civil war of 1936-9. C. is still Moorish in appearance, has 4 ruined castles, and has many fine buildings, including a 13th-cent. former cathedral. It has metallurgical and glass industries, and is surrounded by many mining tns. Pop. 117,350.

Cartagena, city, seaport, and the cap. of Bolívar dept., Colombia, on the Caribbean coast, was founded 1533. It has a fine harbour, and the Dique Canal connects the port with the Magdalena R. C., once the richest city in the New World, was taken by Drake, 1586; pillaged by Fr. buccaneers, 1697; bombarded by Adm. Vernon, 1741; taken by Morillo, 1815, but surrendered to the Royalists soon afterwards. Freed from the Sp. yoke, 1821. It exports agric. products, oil, gold, and platinum. Pop. (including suburbs) 125,600.

Cartago: 1. Central prov. of Costa Rica on the Caribbean slopes of the Cordillera de Talamanca. The chief products are agric.; stock raising and dairying are carried on. Area 1000 sq. m.; pop. 100,700.

2. Cap. of the above prov., 12 m. ESE. of San José, on the transcontinental railway and Inter-Amer. highroad. It was the cap. of Costa Rica until 1823. It is situated on a fertile tableland, 5622 ft above sea level, at the base of the volcano Irazú (11,260 ft), near which are hot mineral springs, the resort of invalids. There is a cathedral with a stone figure of La Negrita, patroness of Costa Rica. An earthquake in 1723 caused the city to be flooded by water from the crater; in 1841 the greater part of the city was destroyed by earthquake. It is a market for livestock and agric. produce. Pop. 14,737.

Carte, Richard D'Oyly, *see* D'OYLY CARTE.

Cartel, from the Ger. use of the word *Kartell*: a joint marketing agency estab. by a group of independent producers. The earliest Eng. C. was the Newcastle Vend (for selling coal) in the 17th cent. More generally a C. is a terminable association between independent firms to fix prices, output, etc. (a trust is permanent). The industrial C. arose out of the need to control the market in order to stabilise prices. From that it developed into an organisation which instituted a central selling office to dispose of the product for the benefit of all members of the C. In some C.s, however, each constituent member was left free to operate its own market, although the output and price were controlled by the C. In 1883 'Irma,' the International Rail Makers' Association, came into being, and was the first of the international C.s which became a feature of modern industry, especially after the peace treaties following the First World War. States at one time politically and still industrially united were then split up, making international industrial agreements essential. In small industries, such as the magnesia industry, the C. amounts to a close combine governing a monopoly. In larger industries, however, an international C. may be no more than an agreement between national

combines to respect each other's markets. International C.s have been engendered by the tariff system, and being liable to the abuses often allied to a monopoly, C.s have been from time to time subjected to political control.

International cartels. The meaning of C. in current usage has extended so as to include patent and process exchange agreements between firms in different countries—such, for example, as those concluded by Standard Oil, International General Electric, and other Amer. concerns with foreign interests. Often patent exchange arrangements contain marketing agreements and, in fact, the marketing agreements may be the reason for exchange of patents and processes. This type of C. arrangement is, probably, the one which primarily concerns Amer. firms. International C.s are sometimes formed under governmental auspices and with gov. participation, and indeed some of the most notorious international C.s have been negotiated by govts. This was true of the tin and rubber C.s; while, again, the U.S. Gov. entered into agreements for wheat and coffee. In the course of the Second World War anti-C. critics were loud in their condemnation of international C.s, regarding them as monopolistic, conspiratorial, and even fascist in character; whereas pro-C. critics, like Lord McGowan of Imperial Chemical Industries, have described C.s as a means of assuring orderly marketing, planned expansion of international trade, and elimination of cut-throat prices. Most of the big international C.s have sprung from the lack of balance between productive capacity and current consumption. Extensive Amer. participation in C.s would seem to require a considerable degree of co-operation between firms in the domestic market, but since the U.S.A. is committed to an anti-trust policy at home, such participation seems improbable, at least in those industries in which exporting firms are not only many in number but also occupied in producing for the domestic market. Amer. hostility to monopoly is not necessarily shared by other countries, and many European countries may favour international C.s, together with import restrictions, export bounties, and other measures designed to cope with excess production.

The menace of the great Ger. C.s which existed before the Second World War lay in the fact that these great combines were producers for the Ger. war machine. Most of them were excessive in size, were monopolists, and essentially anti-democratic. For these reasons decartellisation laws were made for the Amer. and Brit. zones of occupation in Germany early in 1947. Some 5 U.S. zone concerns, with about \$25,000,000 assets, were automatically considered to be 'excessive' concentrations by employing 10,000 or more persons: the Opel motor works at Russelsheim; the Bosch works at Stuttgart; the Metall Gesellschaft at Frankfurt; the Gute Hoffnungs Hütte, with H.Q. at Oberhausen (in the Brit. zone) and large subsidiary works at Nuremberg;

and the Degussa works. The trial in 1947 before an Amer. military tribunal at Nuremberg of Germany's vast chemical combine, I. G. Farben Industrie (Dye Trust) as war criminals showed that the combine participated in no fewer than 500 undertakings outside Germany, apart from its foreign manufacturing plants and holding companies. Working intimately with Nazi foreign policy its international affiliations and contracts ran into thousands, including C. agreements with major concerns in America, Britain, France, and many other European countries, which were used as an economic weapon in the preparation of war. From 1935 onwards all C. agreements were cleared by Farben through the military economic staff of the *Wehrmacht*. Their deliberate purpose was to restrict industrial development and scientific research outside Germany, especially in countries which Hitler designed to attack. It was also shown at the trial how a C. arrangement among Farben, the Aluminium Co. of America, and the Dow Chemical Co. greatly restricted the production of magnesium in the U.S.A. and prohibited exports to Europe except to Germany and, in negligible amounts, to Great Britain—so that Britain and the rest of Europe became completely dependent on Germany for magnesium, for which Britain was in a desperate situation on the outbreak of war. The trial also showed how, by means of C. agreements with the Standard Oil Co. of New Jersey, Farben delayed the development and production of buna rubber in the U.S.A. until 1940, while at the same time making Germany independent of rubber imports. See also COMBINE and TRUSTS (COMMERCIAL). See *International Cartels, Combines, and Trusts*, with essay by the Ger. authority, R. Leifmann, trans. 1927; also H. Levy, *Monopolies, Cartels, and Trusts in British Industry*, 1927, and A. P. L. Gordon, *The Problem of Trust and Monopoly Control*, 1928.

Carter, Elizabeth (1717–1806), poetess and translator, b. Deal. She was famous for her knowledge of languages, and pub. her *Poems upon Particular Occasions* at the age of 21. Her trans. of Epictetus, pub. 1758, won the admiration of Dr Johnson. See life by her nephew, M. Pennington, 1808, and D. Gardiner, *English Girlhood at School*, 1929.

Carter, Howard (1873–1939), Egyptologist, b. Swaffham, Norfolk, youngest son of Samuel John C., animal painter. Went to Egypt on the staff of the Archaeological Survey, 1891; engaged in excavation till 1899, notably with Sir Flinder Petrie at Tel el-Amarna. Became inspector of antiquities dept of Egyptian Gov., and made numerous excavations; and finally, working for the Earl of Carnarvon, on 17 Feb. 1923, opened the sealed door of the tomb of Tutankhamen (q.v.). Pubs.: *The Tomb of Thoutmôsis IV* (with P. E. Newberry), 1904; *Description and Excavation of the Tomb of Hâtshopsittâ*, 1906; *The Tomb of Tutankhamen* (with A. C. Mace), 1923–1933.

Carter, Robert Brudenell (1828–1918), ophthalmic surgeon, b. Little Wittenham, Berks, received his medical training at the London Hospital. During the Crimean War he served as staff surgeon, and won both Eng. and Turkish medals. In 1870 he was appointed ophthalmic surgeon to St George's Hospital, and from 1893 to 1903 still attended that hospital for consultations. He was Hunterian prof. at the Royal College of Surgeons (1881) and later delivered the Lumleian lectures to the Medical Society of London. His writings include *Practical Treatise on Diseases of the Eye*, 1875, *Manual of Ophthalmic Surgery*, 1887, and *Eyesight, Good and Bad*, 1880. In 1896 his report on the vision of London elementary schoolchildren was pub. as a parl. paper. He also trans. into English sev. Ger. works on ophthalmology.

Carteret, Sir George (c. 1609–80), naval officer and Royalist politician, nephew of Sir Phillip C. (d. 1643). By 1633 he was a captain in the navy; comptroller of the navy, 1639. C. became lieutenant-governor of Jersey, 1643. He was knighted, 1646, and was one of the original proprietors of New Jersey in America, 1650. Forced to yield Jersey to the Commonwealth, 1651, C. served for a time under Vendôme in the Fr. Navy. He was treasurer of the Eng. Navy, 1661–1667. C. became sole proprietor of N. New Jersey, 1676; he was also one of the original proprietors of Carolina.

Carteret, John, 1st Earl Granville (1690–1763), statesman, educ. at Westminster School and Christ Church, Oxford. In 1711 he took his seat in the House of Lords as 2nd Baron C. As he was Whig by conviction, he followed the leadership of Stanhope and Sunderland. From 1719 to 1724 he distinguished himself for his diplomatic services. Dispatched by Stanhope as ambas. extraordinary to Sweden, he negotiated two treaties: one between Sweden and Hanover and Prussia, the other between Sweden and Denmark. From 1724 to 1730 he was lord-lieutenant of Ireland. From 1730 to 1742 he devoted his activities to the overthrow of Walpole's ministry, and having achieved his object, became the true leader of the subsequent Cabinet. When the Pelhams came into power in 1744, C. ceased to be an effective political force, though in 1751 he accepted the Lord Presidency of the Council. See life by W. B. Pemberton, 1936.

Carteret, Philip (d. 1796), navigator, commander of the second, and unseaworthy, vessel in Wallis's expedition to the S. hemisphere in 1766. Having accidentally lost sight of his leader, he was alone when he discovered Pitcairn Is. and when he gave his name to one of the Solomon Archipelago. He contributed considerably to contemporary geographical knowledge.

Cartesian Ovals, see **OVALS**.

Carthage, anct city situated on a promontory at the NE. extremity of the Bay of Tunis (Africa), the cap. of one of the most important empires of the anct world. Known to the Romans as

Carthago and to the Greeks as Carchedon, its true name was Kirjath-Hadesath, or New Town. This name was given either to distinguish it from Tyre or from an earlier settlement at Utica. The citadel (*Bosra*, Gk *Byrsa*) was approached by 60 steps. C. had 2 harbours, the outer for merchant ships and the inner for warships. Outside the walls of the city was the beautiful suburb of Megalia. C. was settled by the Phoenicians of Tyre, a branch of the great Semitic race, about the middle of the 9th cent. BC. There were already Punic settlements in the N. of Africa—Utica, Tunis, and Hadrumetum—but of these C. finally obtained the chiefdom. The story of the city's first struggles for power are unknown, for she does not enter hist. till the 6th cent BC, when she is already the centre of a prosperous commerce, and the ruler of extensive dominions, extending from Cyrene to the Straits of Gibraltar, with most of the W. Mediterranean is., and with settlements in Spain and Gaul. The pop. of the city and its dist. consisted of (1) pure Phoenicians; (2) Libyo-Phoenicians, the offspring of intermarriages between the settlers and Africans; (3) the Libyans themselves, reduced to servitude and forming a large part of the Carthaginian army; (4) the Nomads, wandering tribes which furnished the city with irregular cavalry. The extent of the commercial genius and maritime daring of the Carthaginians may be seen from the fact that Hanno, one of their admirals, is reported to have sailed, in the 6th cent. BC, round the NW. of Africa and up the Senegal R., returning then only through the failure of his provisions. The hist. of C. is mainly taken up by its wars with the Greeks and Romans, and to the first of these we must turn. The struggle was waged chiefly in Sicily, where C. came into conflict with the Greeks of Syracuse. In 480 BC a great battle was fought at Himera, between Hamilcar and Gelo of Syracuse, in which the former was defeated and slain. Some time later the war was renewed, and Hannibal, grandson of Hamilcar, entered Sicily to avenge his grandfather, which he did by storming Selinus and capturing Himera. In 405 a treaty was made, but 7 years later war broke out afresh, and Dionysius (q.v.), tyrant of Syracuse, was besieged in his city. He was saved, however, by the pestilence which broke out among the Carthaginians, and the latter were decisively beaten. The struggle continued, till in 344 Syracuse sent for help to the mother city of Corinth, and received auxiliaries under Timoleon, who inflicted a crushing defeat on the Carthaginians at the Crimissus in 340. There was peace for 30 years, until Agathocles (q.v.) was tyrant of Syracuse. Then C. again attacked, but Agathocles transferred his forces to Africa, and carried the war to the very walls of C., which he would have taken had he not been suddenly called home. In 277 BC, Pyrrhus (q.v.) was called to the aid of the Syracusans, but Rome and C. were leagued against him, and he could do

nothing permanent. More important even than this war was the mighty struggle with Rome. Treaties made between the two cities in 509 BC, and about 450 BC, show that C. was then the superior, and was gradually increasing her restrictions on Rom. commerce. The first war lasted from 264 to 242 BC, and once again Sicily was the cause. The Romans hastily built a fleet, and won 2 great sea-fights at Mylae (260) and at Ecnomus (256 BC). Regulus carried the war into Africa, but his army was cut to pieces. Peace was made after another naval victory for Rome. From 241 to 236 BC C. was engaged in a bloody civil war, which demonstrated the instability of her constitution (see Aristotle, *Politics*, ii.). This led Hamilcar to establish himself in Spain, and to try to found there a new empire which should subdue Rome. After his death and that of his son-in-law Hasdrabal, his son Hannibal, sworn enemy to Rome, was chosen leader of the army. His attack on Saguntum in 219 BC was the commencement of the second Punic war (see HANNIBAL). The battle of Zama in 202 put an end to this war, and for the next 50 years the hist. of C. is mainly a record of political struggles. It was continually harassed by Rome, and in 149 BC C. was goaded into the third Punic war. It lasted for 3 years, C. being taken and utterly destroyed. It remained in ruins for nearly 30 years, at the end of which time a Rom. colony was estab. on the site. This continued until Julius Caesar and Augustus built a new city with the name Colonia Carthago. It became an important place in eccles. as well as in civil hist. C. was taken by the Vandals in 439, retaken by Belisarius in 533, and finally destroyed by the Arabs in 697. See R. Bosworth Smith, *Carthage and the Carthaginians*, 1878; F. W. Kelsey, *Excavations at Carthage*, 1926; H. P. Hurd, *The Topography of Punic Carthage*, 1936; *The Cambridge Ancient History*, vol. iv.

Carthage, Cape, promontory of N. Africa, jutting out into the Mediterranean. N. of Tunis lagoon are ruins of the ancient city of C.

Carthage, Synods of: 1. In 411 a synod of C. condemned the Donatists, Augustine and Petilian being the protagonists, and Marcellinus (tribune to the Emperor Honorius) presiding.

2. In 412 a synod was held at the instance of Aurelius, Bishop of Carthage; Paulinus of Milan was invited to appear as the accuser of Coelestius, in whose person the Pelagian heresy was first recognised by the church and condemned. See PELAGIUS.

Carthago Nova, see CARTAGENA.

Carthamin ($C_{14}H_{16}O_7$), red colouring matter prepared from safflower. It was used as a dye (q.v.) for silks and cottons and requires no mordant.

Carthamus, genus of Compositae common to Asia, Africa, and the Mediterranean. *C. tinctorius*, the safflower, is an annual found wild in Egypt and the Levant the flowers contain a colouring principle, and are used by dyers as the

tabarder of Queen's College, and studied under Tully, 1650. Secretly ordained by Bishop Skinner, 1655, C. became vicar of Walthamstow, 1657. He was vicar of Barking, 1660; of St Paul's, 1665; prebendary of Wells and of Durham, 1672; dean of Ripon, 1675; Bishop of Chester, 1686. He was a staunch supporter of James II, and sympathetic towards the Rom. Catholics. After the king's flight he left England. His appointment as Bishop of Salisbury by James II was never confirmed. He d. in Dublin. See J. Hunter's ed. of *Diary of Thomas Cartwright, Bishop of Chester*, 1843.

Cartwright, William (1611-43), clergyman and dramatist, b. Northway, near Tewkesbury. Educ. at Westminster and Oxford, he took orders, was a zealous Royalist and a florid preacher. He wrote spirited lyrics and sev. plays, of which *The Royal Slave*, performed before the court at Oxford, was the most successful; others are *The Siege* and *The Lady Errant*. He was a friend of Ben Jonson. See life by R. C. Goffin, 1918.

Carum, an umbelliferous genus of sub-tropical and temperate plants, which are glabrous herbs with perennial tuberous roots, pinnate leaves, and white flowers. *C. carvi*, Caraway (q.v.), is the only important species, grown for its 'seeds.'

Caruncle, botanical term for a hard, small extra, seed-covering, or *raii*, also called a *strophiole*. Examples may be seen in species of Euphorbiaceae, e.g. in *Euphorbia lathyris*.

Carupano, port of Sucre state, Venezuela, on the N. of the peninsula of Paria, with a lighthouse and excellent harbour. Sulphur (particularly important), copper, silver, lignite, and lead are mined in the neighbourhood. Exports are cocoa, coffee, sugar, tobacco, hides, etc. Pop. about 30,000.

Carus, Julius Victor (1823-1903), Ger. zoologist, studied medicine at Leipzig, Würzburg, and Freiburg, and in 1849 became keeper of the museum of comparative anatomy at Oxford. His appointment to the chair of comparative anatomy at Leipzig dated from 1853. Though he was the author of sev. scientific text-books, such as *Handbuch der Zoologie* (with Gerstäcker, 1863, etc.), his splendid monographs on many problems in zoological research were his most valuable contribution to contemporary science.

Carus, Marcus Aurelius (AD 282-3), Rom. emperor, surnamed Persicus, elected by soldiers on the death of Probus. He was a scholar and a soldier, and immediately after his accession he set out against the Persians, first conferring on his 2 sons, Carinus and Numerian, the title of Caesar. He ravaged Mesopotamia, conquered the important cities of Seleucia and Ctesiphon, and advanced beyond the Tigris, when he was killed supposedly by lightning, though some suspicion attached to the praetorian prefect Aper.

Caruso, Enrico (1873-1921), It. tenor, b. Naples, one of a large family in humble circumstances. He began his study of singing at 18, under Guglielmo Vergine, and he made his first appearance on the

stage in 1894. He created tenor parts in new operas by Giordano, Cilea, Franchetti, and others. In the spring of 1902, at Monte Carlo, he sang with Melba in *La Bohème*. He was then engaged for Covent Garden, London, where he appeared as the duke in *Rigoletto*, 14 May 1902. Without any special musical training he early attained a worldwide fame. He sang at Covent Garden for some years prior to 1907, when he received the M.V.O. In the same year he went to the Metropolitan Opera House, New York, earning almost fabulous sums. He sang there throughout the years of the First World War, proving a tremendous draw. His most popular and characteristic roles were Canio in *Pagliacci*, Rodolpho in *La Bohème*, the duke in *Rigoletto*, the lover des Grieux in *Manon Lescaut*, Edgardo in *Lucia*, and Radamès in *Aida*. The gramophone records of his voice brought him a colossal income. His voice was singularly free from strain and reached top notes of rare power and virility, yet always velvety and sympathetic. He ruptured a blood vessel in his throat while singing in 1920, and as the result of ensuing complications he d. in Naples the following year. See Dorothy Caruso, *Enrico Caruso*, 1945.

Carvacrol, phenolic liquid. Formula $C_{10}H_{14}O$, boiling point 236° . It occurs in the essential oil of *Origanum majoranoides* (the sweet majoram of Cyprus), but is generally obtained by heating carvone with phosphoric acid.

Carvel (for *caravel*, from Gk *karabos*, a light ship, through It. *carabella*): 1. Has been used in different countries of widely differing ships. Columbus discovered America in a caravel, that is a roundish galley-rigged vessel, with 3 towers on deck. The French use C. for a herring-boat; the Turks for a man-of-war. 'C. built' is applied to a boat 'whose planking is flush with edges laid side to side' as distinct from 'clinker built.'

2. Is used in Manx and Breton literature as a synonym for carol or ballad. Originally it always referred to a lyric set to some dance measure.

Carver, George Washington (1860-1943), Amer. Negro chemurgist and agric. experimenter. B. of slave parentage in Missouri, he none the less succeeded in making the degree of Master of Science at the Iowa State College, working there as a botanist until 1896, when he went to the Tuskegee Institute in Alabama. He spent his life in agric. research for the betterment of the S. and of his people. Persuading farmers to vary their crops by planting soil-enriching peanuts and sweet potatoes instead of soil-exhausting cotton, he next solved the problem of finding new uses for these crops, which had become over-abundant as food-stuffs. From the peanut he made cheese, flour, coffee, milk, dyes, ink, soap, etc. From the sweet potato came flour, vinegar, molasses, rubber, etc. Years before plastics from wood waste were first attempted, C. was making synthetic marble from wood shavings. In 1940 he gave his life savings of £33,000 to establish the C. Foundation

to carry on his research. See R. Holt, *George Washington Carver*, 1921.

Carver, John (c. 1575-1621), Pilgrim Father who emigrated to America in the famous *Mayflower*, and was appointed the first governor of the sturdy Plymouth colony (1620-1). He had taken refuge at Leyden in 1609 as the result of religious persecution in England.

Carver, Jonathan (1710-80), Amer. traveller, served in the Fr. and Indian wars, and after the peace of 1763 set out on a journey of exploration westward. Finally he reached the Mississippi by way of the Fox and Wisconsin R.s., and obtained from the Indians a grant of land between the St Croix and the Mississippi. Explorer of the country of the Upper Mississippi, he was the first traveller to visit the falls of St Anthony (1766). His *Travels through the Interior Parts of North America in the Years 1766, 1767, 1768* was pub. in London in 1778. No narrative of early travel in N. America has ever outrivalled the popularity of this work. C., however, was in serious financial straits and this success came too late to relieve his poverty. The sequel or second part of his work described the manners and customs of the Indians, but it is little more than a paraphrase of earlier Fr. accounts and even C.'s authorship has been questioned. This plagiarism in the second part and occasional falsification in the first do not justify doubts on the main facts of the first part of his work, for his original *Journal* or *jour.*, now in the Brit. Museum, fully bears these out.

Carvin, Fr. tn in the dept of Pas-de-Calais. It has a 13th-cent. church. Coal is mined, and there are sugar and brandy manufs. Pop. 20,300.

Carving, one of the oldest means of decoration and artistic expression. The word denotes cutting (A.-S. *ceorfan*; Gk *graphein*), and C. differs from mere draughtsmanship in that it secures relief and durability by incisions into the material and by the modelling of its surfaces. C. is thus a general term, and may be applied to sculptural work in wood, ivory, precious stones, terra-cotta, stone, marble, clay, wax, etc. (see **STONE-CARVING** and **SCULPTURE**), but C. is a term that applies in a special sense to decorative detail in architecture and furniture and is particularly associated with wood, the material dealt with in the present article. Oak, on account of its durability, is the most suitable wood for C.; mahogany, teak, chestnut, and Amer. walnut produce good work, whilst lime, sycamore, and the barks of fruit trees are employed for fine work. The fact that the fibres of wood run in a vertical direction and are deficient in lateral cohesion limits the scope of the carver. In all delicate work, such as tendrils or thin stems, the wise artist will take care to follow the grain instead of drawing across it; otherwise his detail will, in course of time, break away. The carver's kit consists of chisels for drawing lines, gouges for making hollows, etc., the 'V' tool for veining, and a mallet. Commercially many mechanical

devices are in use for cheapening and lightening his work. Thus in the case of fretted or scroll work the ornament is glued on the ground after being cut with a fret saw. This method often produces unsatisfactory work, as the 2 woods, being differently affected by the atmosphere, tend to separate. Another machine has a revolving drill which is directed over the ground of the decoration, whilst what is called the C. machine has a number of drills moving over the surface to be carved in accordance with a tracing-point which works over the ground of an iron model of the required design. After fixing his piece of wood to a bench the workman sketches or traces his drawing. Then he grounds out the spaces between the lines with his gouge. The next process of 'boasting' consists in shaping and modelling the details of his pattern, and finally he must clean up the whole. The success of his work largely depends on his appreciation of the appropriate relativity of light and shade. C. is one of the most primitive and popular forms of ornamentation. Among savages to-day there is often a just appreciation of the effective contrast of plain with decorated surface. They apply their skill to various objects. Thus the Ijors of the Niger adorn their paddles, the Kaffirs their spoon handles, and the N. Amer. Indian his wooden pipe stem or fish hook. The Egyptians from earliest times carved the faces of the dead in their mummy cases, and in the Cairo Museum is the statue of an elderly man, carved from a solid block of sycamore, which goes back probably to 4000 BC, and as a work of realism has never been surpassed in that country. In Greece the earliest sculptors worked in wood, and for a long time their *Xoana*, or images of the gods, were religiously preserved. In Scandinavian countries there is an ant. tradition of C. and the wooden doorways of Aal, Norway (c. 1200), may be cited. In Europe there are 2 great periods of C., the Gothic (12th to 15th cents.), and the Renaissance (16th to 17th cents.), but of the 2 the former produced work immeasurably superior. In the Gothic period the wood carver was a master craftsman, who travelled with his band from church to church. He was actuated by high religious and social ideals, and was encouraged to respect the dignity of his craft by the prominence given to it in all church decoration. Thus pulpits, choir stalls, roods, roof screens, font-covers, lecterns, doors, and retables all owed much of their beauty to his skill. For the splendour of his architectural imagination, for the patient minuteness and accuracy of his detail, and for his loving and faithful imitation of natural forms, the Gothic workman is unsurpassed. The endless and fascinating diversity of treatment was due to the free play given to individual carvers. Colour has been used since ant. times to heighten the effect of C., and the splendid richness of Gothic work owed not a little to harmonious colour schemes of blues, reds, greens, golds, etc. The magnificent roof of

conceal the intention of the Allies to make an actual invasion of the continent of Europe. The conference adopted and pub. a formula regarding peace terms. It was that there must be unconditional surrender, not merely on the part of the dictators (with whom it had previously been declared that the Allies would never negotiate), but on that of the 3 Axis nations.

Casacalenda, It. tn. in Abruzzi e Molise (q.v.), 16 m. NE. of Campobasso (q.v.). Pop. 6000.

Casale Monferrato, It. tn. in Piedmont (q.v.) on the Po (q.v.). In 1474 it became cap. of the marquisate of Monferrato (q.v.), and it was for long an important fortress. The cathedral dates from the 12th cent., and there are other ant. churches and palaces. There are cement, textile, and footwear industries, and a large trade in agric. produce. The tn was once noted for its barrel organs. Pop. (tn) 25,500; (com.) 37,100.

Casalmaggiore, It. tn. in Lombardy (q.v.) on the Po (q.v.). It has a neo-classic cathedral, and manufs. glass and pottery. Parmigiano (q.v.) is buried here. Pop. 4500.

Casalnuovo, see MANDURIA.

Casalpusterleno, It. tn. in Lombardy (q.v.), 30 m. SE. of Milan (q.v.). It has textile manufs., and a trade in Parmesan cheese. Pop. 5000.

Casals, Pau (1876-), Sp. cellist and conductor, b. Vendrell, Tarragona, and educ. at Barcelona and Madrid Conservatories. His first public appearance in England was at Crystal Palace, 1898, and in Paris the same year, since when his playing has won him international fame. In 1906 he married Guilhermina Suggia, the Portuguese cellist (q.v.), and in 1914 Susan Metcalfe, Amer. singer. He married for the third time in 1957. He founded the Pau Casals Symphony Orchestra of Barcelona in 1920 and was its conductor. He was made Citizen of Honour of Madrid in 1935 and Member of Honour of the Sp. Academy the same year. He now lives at Prades in the Pyrenees, where he holds chamber-music festivals in the summer.

Casamance, riv. in the W. of Africa in the Fr. colony of Senegal. It forms an estuary which enters the sea at 12° 54' N., 15° W.

Casamare, see ARPINO.

Casamassima, It. tn. in Apulia (q.v.), 14 m. SSE. of Bari (q.v.). Pop. 8500.

Casamicciola, It. tn. on the N. side of the Is. of Ischia (q.v.). The old tn was destroyed in an earthquake in 1883, and the present tn dates from then. It has hot mineral springs (150° F.). Pop. 4300.

Casanova de Seingalt, Francesco (1730-1805), It. artist, younger brother of the famous adventurer. B. in London, but gained his reputation in Paris as a painter of battle pictures and landscapes. His pictures can be seen at Rouen, Nancy, and Lyons.

Casanova de Seingalt, Giovanni Jacopo (1725-98), It. adventurer noted for his wit, accomplishments, and intrigues. He was b. in Venice, brother of Francesco

C. (q.v.). His father was of old and good family, but owing to his having adopted the theatrical profession he was alienated from it. Giovanni's mother was Zanetta Farusi, a shoemaker's daughter. At the age of sixteen he entered a seminary at Venice, but was soon expelled for immoral conduct. Through his mother he was given a situation in the household of Cardinal Acquaviva, but he quickly found it far too dull and took to travelling. His career of love affairs, intrigue, and hazard led, after wanderings to one cap. after another, often in the most aristocratic society, to his imprisonment in Venice. Escaping from Venice, he was appointed to manage state lotteries in Paris. After further European wanderings, including England, Poland, and Spain, he returned once more to Venice in the capacity of state spy, and later retired to Bohemia. His famous memoirs, 1876, throw a revealing light on the manner of life he led. See life by B. Dobrée, 1933.

Casarano, It. tn. in Apulia (q.v.), 23 m. S. of Lecce (q.v.). Pop. 7000.

Casas, Bartolomé de las, see LAS CASAS.

Casas, Ciudad de las, see SAN CRISTOBAL.

Casas Grandes, ancient city in the state of Chihuahua, Mexico, 130 m. from El Paso (Texas, U.S.A.). It has ruined buildings erected by Pueblo Indians and discovered in 1860 by the Spaniards. To-day there is a small agric. vil. on the site. Pop. 1126.

Casaubon, Isaac (1559-1614), Fr. theologian and classical commentator, b. Geneva, his family having come originally from Dauphiné. At the age of 24 he was appointed prof. of Greek at Geneva, and 3 years later he married the daughter of the great Fr. scholar, Henri Estienne. Henry Wotton, in the course of his continental tour, lodged with C. at Geneva. In 1596 C. accepted the Gk professorship at Montpellier. The univ. of Paris had closed its doors against all but Catholics and Henry IV dared not appoint a Calvinist. However, he gave a pension to C., with a promise of the royal librarianship when it became vacant, which was not until 1604. After the assassination of Henry, C. was forced to move to London, where he was made prebendary of Canterbury and given a pension. He was unjustly charged, after the pub. of his reply to the *Annals* of Cardinal Baronius, with having sold his conscience in order to gain the favour of James I. The truth was that he had for some time been drawing near to the Anglo-Catholic point of view. He devoted his life to classical study, and he helped to give a connected knowledge of the lives of the ancients. He pub. eds. of Athenaeus, Aristotle, Diogenes Laertius, Theophrastus, Polybius, Theocritus, Persius, Suetonius, etc.; also the treatises *De Satirica Graecorum Poësi et Romanorum Satira* and *De Libertate Ecclesiastica*. C.'s *Correspondence*, in Latin, was collected by van Almeloveen (1709). His diary, *Ephe-merides*, ed. by his son Meric (q.v.), is preserved in MS. in the Chapter Library, Canterbury, and was printed by the

Clarendon Press, 1850. His life was written by Mark Pattison, 1875.

Casaubon, Meric (1599-1671), son of Isaac C. (q.v.), accompanied his father to England, and was educated at Christ Church College, Oxford. Was made prebendary of Canterbury and vicar of Monkton in Thanet, deprived of his appointments in 1644, but restored in 1660, and eventually became rector of Ickham. He inherited his father's taste for classical research, and vindicated the memory of Isaac C. in 2 Lat. works.

Casbeck, see KAZBEK.

Casca, Publius Servilius, tribune of the plebs at Rome in 44 BC. He was one of Caesar's assassins, and was killed at the battle of Philippi (42 BC).

Cascade Connection, a combination of amplifiers (q.v.) in which each amplifies the output of the preceding one. Also a combination of an alternating current induction motor with a commutator motor, the brushes of the latter being supplied from the rotor of the induction motor. Also a combination of capacitors in a high-voltage impulse generator. See ELECTRIC MACHINES and ELECTRO-STATIC MACHINES.

Cascade Range, mts in the U.S.A. situated in the NW. and stretching in a N. to S. direction in the states of Washington, Oregon, and California. It is composed of granite in N. Washington, but all the remaining part is volcanic, covered many times over with flows of lava. The range has either on its crest or sides many extinct volcanoes, such as Shasta in California, rising to 14,162 ft; Jefferson, 10,495 ft, and Hood, 11,245 ft, both of which are in Oregon; Adams, 12,307 ft, St Helen's, 9671 ft, Rainier, 14,408 ft, and Baker, 10,750 ft, in Washington. The general height of the whole range runs from 6000 to 8000 ft. The Klamath and Columbia R.s cut E.-W. through the range. The chief resource is timber, and the rvs. of the Pacific slope are used for hydro-electricity.

Cascara Bark, obtained from *Rhamnus purshiana*, the Californian bearberry or buckthorn, which is a N. Amer. species of Rhamnaceae. The bark is taken from the tree and dried, when it yields a fluid extract, known as *C. sagrada* (sacred bark), which is used as a cathartic (q.v.).

Cascarilla, which is a S. Amer. genus of Rubiaceae, is noted for its bark, which resembles that of cinchona, and is used as a valuable aromatic and tonic. It arrives in Europe in short, thin, brittle rolls, and so receives its name, which signifies little bark. The bark of *Croton C.*, a species of Euphorbiaceae, is known as C. bark, and is used as a tonic.

Cascina, It. tn, in Tuscany (q.v.), on the Arno (q.v.), 7 m. ESE. of Pisa. It was the scene of a Florentine victory over the Pisans in 1364. There is a Romanesque cathedral, and parts of the old walls remain. The tn is known for its furniture. Pop. 27,000.

Case, Thomas (1844-1925), philosophical writer, educ. at Rugby and Oxford. In 1883 he was appointed

lecturer in Gk hist. at Christ Church, and in 1889 he was elected to the Waynflete chair of moral and metaphysical philosophy. His publs. include *Realism in Morals*, 1877, and *Physical Realism*, 1888.

Case, in grammar, one of the forms of declension to which nouns, pronouns, and adjectives are subject. Means literally a falling, and was so applied because the subject of a sentence had to be imagined as an upright line, with the other words falling away from it. The Eng. language contains only the genitive and some trace of the dative (as in 'whilom,' 'seldom'); the Ger. language has 4: nominative, genitive, dative, and accusative; Latin has 6: nominative, genitive, dative, accusative, vocative, and ablative; Greek has no ablative; Sanskrit has 2 additional C.s, locative and instrumental. Eng., Fr., and It. nouns and adjectives have lost their C.-endings, but their pronouns are still modified, while polysynthetic languages (as Finnish and Magyar) acquire very many C.-endings.

Case, Action upon the, obsolete name for one of the forms of action into which remedies for civil injuries were classified by the common law (q.v.) of England. In the early days of Eng. common law the remedies for civil injuries were few and rigid. Hence the chancellor and his subordinates, who had control of the office out of which writs were issued, initiated in right of an assumed equitable (see EQUITY) jurisdiction the practice of formulating writs to meet C.s unprovided for by the common law. This practice at length received legislative sanction in the Statute of Westminster, which permitted actions to be framed *in consimili casu*, i.e. by analogy with similar C.s or sets of circumstances for which there already existed a stereotyped form of action or writ. Hence the term actions *in consimili casu* or, more shortly, 'actions on the C.' The common law readers subsequently exercised considerable ingenuity in extending the action upon the C. to meet all manner of C.s bearing some analogy to existing forms. By the Judicature Act, 1873, all the old forms of action were abolished and no set style of pleading is now required at all, provided the plaintiff shows in his pleadings that the facts come within some legal principle. The fundamental importance of the evolution of forms of action out of actions upon the C. lies in the development of new and more equitable principles of law.

Case-hardening. In some parts of machinery toughness of material must be accompanied by durability of surface. These 2 conditions are satisfied by using wrought iron and transforming its external parts into steel. Such material is used for axles, pins, links, and the edges of cutters, the result being greater accuracy and durability. See *Metalurgical Heat Treatment*, under METALLURGY.

Case of Impositions, see BATES'S CASE. **Case-shot**, or **Canister**, projectile of artillery, designed for use at close quarters.

A tin or sheet-iron cylinder is filled with bullets, varying in number and weight from $\frac{1}{2}$ oz. to 1 lb., the interstices between which are closed with sawdust. When this is fired it immediately breaks, scattering the balls considerable distances. As their velocity is small, they are ineffectual at a greater range than 300 yds.

Casein, a protein, an important constituent of milk and the prin. one of cheese. From the former it is precipitated by means of rennet, which is an extract from the mucous membrane of the fourth stomach of a milk-fed calf. It is a valuable food product containing phosphates. It is also precipitated by mineral acids, but is not coagulated by heat. It is allied to albumen and also to legumin found in the seeds of leguminous plants such as peas and beans. *See also* ADHESIVES.

Casella, Alfredo (1883-1947), It. pianist and composer, b. Turin, son of a teacher at the Liceo there. He studied at the Paris Conservatoire under Dizmer (pianoforte) and Fauré (composition). He then toured successfully as a pianist and orchestral conductor. From 1912 he directed popular concerts at the Trocadero, Paris. In 1917 he founded in Rome the Società Nazionale di Musica (afterwards Società Italiana di Musica Moderna); reformed, in 1923, as the Corporazione delle Musiche Nuove (It. section of the International Society for Contemporary Music). As a composer he reacted strongly against the too exclusive and melodramatic operatic tendencies in the Italy of his time and aimed at reviving what he called the classical Italian, predominantly instrumental music; but his music also shows various foreign, especially Fr. influences. His works include the operas *La donna serpente*, *La favola d'Orfeo*, *Il deserto tentato*; ballets *Le Couvent sur l'eau*, *La giara*, and 2 others; 3 symphonies, *Elegia eroica* for orchestra, various concertos; *Notte di maggio* (Carducci) for voice and orchestra, chamber and piano music and songs.

Casemate, loophole gallery or caponier, under the protection of which the garrison of a fort may fire upon the enemy below. C.s are utilised to protect guns, hospitals, stores, etc., from high-angle or vertical fire; or they may be used as barracks. In architecture, a hollow moulding, such as the cavetto.

Casement, Sir Roger David (1864-1916), Irish rebel, b. Kingstown, co. Dublin, the younger son of Capt. Roger C. of Ballymena, co. Antrim. He became travelling commissioner to the Niger Coast Protectorate in 1892, and in 1895 Brit. consul at Lourenço Marques. Later he was at Loanda and then at Boma, in the Congo. He reported in Dec. 1903 on the cruelties practised in the rubber plantations of the Upper Congo. Subsequently he held consular posts in S. America, and in 1910 he made a report (pub. 1912) on the inhumanities in the rubber stations of the Putumayo R. in Peru. In 1911 he was knighted. He retired to Ireland in 1913, and soon after the outbreak of the First World War his sympathy with the cause

of Irish republicanism led him to go to Germany, where he urged Irish war prisoners to form a brigade for service against the Allies. In April 1916 he set out for Ireland in a Ger. submarine, his mission probably being to try to stop the 'Easter Rising' (*see* SINN FEIN). On landing at Banna, co. Kerry, he was arrested. He was tried in London for high treason, 26-29 June, and, having been degraded from all his honours, was hanged at Pentonville 3 Aug. 1916. Before his death he was received into the Rom. Catholic church. There has been much controversy about C.'s character. In recent years the Irish Gov. has asked vainly for the return of his remains to Ireland. *See* G. de C. Parninter, *Roger Casement*, 1936; R. MacColl, *Roger Casement: a New Judgment*, 1956; A. Noyes, *The Accusing Ghost, or Justice for Casement*, 1957.

Casement, wooden or metal window frame which is hung by one of its edges—top, bottom, or sides—to open outwards or inwards. A window hung on pulleys to slide up and down is a sash-window, a type invented during the 17th cent.

Casentino, name given to the valley of the upper Arno (q.v.) in the prov. of Arezzo (q.v.), Italy. Tourists frequent it, as the scenery is very picturesque. It was celebrated by Dante (q.v.).

Caserta: 1. Prov. of Italy, in NW. Campania (q.v.). It has a coastline on the Tyrrhenian Sea, and has a plain in S. and W. The mts of the NE. are broken up by the wide, fertile valleys of the Volturno (q.v.) and its trib., the Calore. Cereals, olives, fruit, wine, and timber are produced, and marble is found. This part of Italy was once called *Terra di Lavoro*. Area 1040 sq. m.; pop. 623,000.

2. It. tn, cap. of the prov. of C., 15 m. NNE. of Naples (q.v.). It was only a vil. until the King of the Two Sicilies built the magnificent royal palace here in 1752. The palace was an allied headquarters during the Second World War, and it was here that the Ger. forces in Italy surrendered on 29 April 1945. At Caserta Vecchia (Old Caserta), 5 m. NE., there is a 12th-cent. cathedral. Silk, chemicals, and soap are manuf., and there is a trade in agric. produce. Pop. (com.) 51,500.

Cash denotes primarily ready money, money in a bank, in a chest, strongbox, or coffer; but since the institution of banks it has come to denote also bank-notes, cheques, money orders, and other documents containing an order to pay on demand as opposed to bills of exchange or other credit instruments (*see also* CURRENCY).

Cash Credit. A C. C. is simply an advance by way of a debit balance in current account, secured to the bank by a bond entered into by a couple of solvent parties who are guarantors for the borrower. It was invented in 1729 by the Royal Brit. Bank (which, though not strictly a Scottish bank, was promoted by Scotsmen with the object of transplanting to Eng. soil the peculiar system of Scottish banking), and designed to get its superfluous capital into circulation by

inducing parties to borrow and embark in business.

Cash on Delivery System is an arrangement whereby the postal authorities, railway companies, and other common carriers undertake on behalf of the vendor to collect the price of goods delivered by them from the recipient and to transmit the money to the vendor. This system is highly popular in most European countries and in India and Japan, but, except between the U.K. and certain Brit. possessions and foreign countries, the system was not, until 1926, introduced into England, owing to the apprehensions of local retail traders. In the face of a long experience of the service between the U.K. and overseas countries participating in the scheme, these fears disappeared, and in 1926 the inland C.O.D. service, limited to parcel post, was introduced, with such successful results that in 1928 the system was extended to packets sent by registered letter post as well as to goods sent by rail to any part of Great Britain. By this service a sum (the trade charge) up to £40 can, under certain conditions, be collected from the addressee and remitted in the form of a Money Order to the sender of a parcel or registered letter or a parcel consigned by rail. Fees: for trade charge or value up to £1, a fee of 1s. 2d.; up to £2, 1s. 4d.; £5, 1s. 6d., and for each further £5 or less, 2d., by rail 6d. extra. The fees charged in the U.K. on C.O.D. packets sent abroad are from 4d. when the trade charge is not over £1, with 2d. extra for each additional £1 of trade charge up to the maximum, which is usually £40 (the fee for the collection of which would be 8s. 6d.), but to some countries is less. If trade charge cannot be collected, the rules for undeliverable parcels apply.

Cash Register, machine, used principally in retail businesses, for recording the amounts of money received and controlling other transactions. Most are supplied with a number of keys, each representing a particular sum. On pressing these keys, or a combination of them, representing the sum of the purchase, a record is made of the purchase and the amount is also shown to the customer by means of an indicator. There are many elaborations of this idea.

Cashel, Tipperary, Rep. of Ireland, the see of a Rom. Catholic archbishop and of a Church of Ireland bishop. Built on the S. slopes of a great height (the Rock of C.), it was the stronghold of the anct kings of Munster, and contains many interesting ruins, a stone-roofed chapel built by Cormac McCarthy, 1127, a cathedral founded 1169, the palace of the Munster kings, etc. Dean Swift, the author of *Gulliver's Travels*, was born here. Pop. 3200.

Cashew Nut, or *Anacardium occidentale*, species of Anacardiaceae which is largely cultivated in tropical America. The fruit is a kidney-shaped nut with a hard shell containing an aroid black juice, but when this has been removed the kernel is found to be oily, pleasant, and wholesome. It is usually roasted

for eating, and is often put into old Madeira wine in the W. Indies to improve the flavour. It is also prepared commercially as a 'butter.' The fleshy stalk has an agreeable flavour.

Cashiering (Fr. *casser*, to break), term in military law denoting the annulment of an officer's commission and his dismissal from the service. It may be awarded by a court martial as a punishment for a number of offences by way of alternative to imprisonment. In the words of the Army Act 'scandalous conduct unbecoming the character of an officer and a gentleman' is met by sentence of C.

Cashmere (India), see KASHMIR.

Cashmere, silky woollen fabric originally manuf. from the hair of the Tibetan and Bokhara goats, and woven in C. (Kashmir). The hair is spun by women, afterwards dyed, and made into the famous shawls, one of which requires the wool of 7 or more goats. These were sold in Europe at prices varying from £100 to £300, but since 1870 the demand for them has not been so great. Imitations are made in France, and attempts have been made to acclimatise the Kashmir goat in Europe and the U.S.A. The name is also given to a fine woollen stuff, made in imitation of the shawl fabric.

Cashmere Goat, see KASHMIR GOAT.

Casilinum, see CAPUA.

Casimir (properly *Kasimierz*), name of sev. kings of Poland who ruled at the following periods:

Casimir I, the Restorer (1034-58), succeeded his father Mieszko II. The early part of his reign was disturbed by civil war plots, and from 1037 to 1040 he was forced to leave the country. His reign proper dates from his return in 1040, when he recovered Silesia from the Bohemians..

Casimir II, the Just (1177-94), was a popular ruler and curbed the power of the nobility.

Casimir III, the Great (1333-70), was b. in 1310. He added Red Russia to his dominions (1341), estab. a code of Polish law and subdued and won the friendship of the Teutonic knights and the Bohemians. He founded the univ. of Cracow (1364), and encouraged commercial relations between Poland and other countries.

Casimir IV (1447-92) was, by birth, Jagiello, Grand Duke of Lithuania, but by his marriage to Jadwiga, the daughter of Louis, King of Poland and Hungary, united Lithuania and Poland. He waged war against the Teutonic knights, and by the treaty of Thorn recovered from them W. Prussia in 1466. During his reign the nobility increased their power and privileges.

John Casimir (1648-88) succeeded his brother, Wladyslaw IV. Brandenburg won her independence in 1657, and the Cossacks rebelled against Poland and finally joined Russia in 1654. Poland also suffered frequent attacks from Sweden and Russia, and C. was forced to take refuge in Silesia. Poland lost Livonia to Sweden (1660), and the ter. beyond the Dnieper was ceded to Russia.

(1667). C. abdicated in 1668, and lived in retirement in France till his death in 1672.

Casimir-Périer, Jean Paul Pierre (1847-1907). Fr. politician, fifth president of the Third Rep. He was b. in Paris, the grandson of Louis Philippe's premier, Casimir Pierre Périer. His first appointment in public affairs was that of secretary to his father, who was minister of the interior under Thiers. In 1876 he was elected deputy for the Aube dept, being re-elected continuously thereafter until he became president of the chamber of deputies in 1893. In 1894, after the assassination of Carnot, he became President of the rep. His presidency only lasted 6 months, as he resigned in Jan. 1895, saying that he had not received adequate support from his ministers. He then abandoned politics completely; but gave evidence on behalf of the defence at Dreyfus's trial.

Casino, tn in New S. Wales, Australia, 500 m. N. of Sydney. Pop. 8000.

Casino: 1. (or *Kursaal*) Many seaside and holiday resorts on the Continent have a C., the most noteworthy being Monte Carlo, Ostend, and Boulogne. The building itself generally contains rooms for gaming-tables, conversation, music, reading, billiards, and dancing.

2. C. is also the name of a card game played all against all or 2 against 2 with a full pack of 52 cards, the dealer dealing 4 cards, 2 at a time, to each opponent, then 2 to the lay-out, then 2 to himself. The lay-out is turned face up and the stock face down beside it. The aim is to collect the 10 of diamonds, scoring 2 points; the 2 of spades, 1 point; the majority of cards, 3 points; the majority of spades, 1 point; any ace, or a sweep of all cards on the table, scoring 1 point. Play is by 'pairing' (a player taking cards on the table by laying down from his hand one of like value), 'combining' (taking a combination of cards on the table by laying down one of like value—e.g. taking a 5 and 2, or 4 and 3, with a 7), and 'building' (playing a card from the hand to combine with one on the table and making an aggregate equal to a larger card in the hand to take both on the next round). Any following player can take the build with a card of like value or 'raise the build' by laying on another card. If a player cannot pair, combine, or build he simply plays a card on to the table. When each player has used his 4 cards, 4 more are dealt round, and so on until the pack is exhausted.

Casiquiare, deep, rapid, navigable riv. of Venezuela, S. America, forming the Orinoco's S. bifurcation. Issuing from R. Orinoco it enters R. Guainia, a branch of Rio Negro, near San Carlos, widening from 300 to 600 yds. It establishes water communication between the Amazon and Orinoco R.s, this stretch being known as the C. Canal.

Casket Letters, famous collection of documents which, if genuine, proves the responsibility of Mary Queen of Scots for the murder of her husband, Darnley. The Earl of Morton, afterwards regent of

Scotland, asserted that he had found the documents in a silver casket in June 1567, after Bothwell had fled from Edinburgh Castle. The casket is supposed to have contained letters, supposedly written by Mary to Bothwell, some Fr. sonnets, a signed but undated promise by Mary to marry Bothwell, and a marriage contract between the two. The documents were produced by Murray in the commission, held at York and later at Westminster, in the same year, 1567. It was alleged that the documents were written by Mary, and the handwriting was compared with that of the queen. Mary herself vehemently denied the charge, and her request to see the original documents or copies of the same was never granted. The documents passed into the hands of the successive regents of Scotland and were lost, apparently after the execution of the Earl of Gowrie (1584). The genuineness of the letters has been doubted by many historians. Three theories have been held with regard to the letters: that they are wholly genuine, that they are wholly forged, and that they are genuine in parts, with interpolations by another hand. Much of the information in the C. L. cannot be traced elsewhere, and much differs from statements found in other documents, but it is practically impossible to tell where the truth lies. In general, however, present-day historians accept the C. L. as substantially authentic. The mystery of Mary's character can never be fully solved, but it has always been an attractive subject to historians and men of letters. The controversy round the C. L. has produced books too numerous to mention, and only a short list of the most prominent books on the subject can be given here. W. Goodall, *Examination of the Letters said to have been written by Mary Queen of Scots to James, Earl of Bothwell*, 1754; F. Mignet, *Histoire de Marie Stuart*, 1854; T. F. Henderson, *The Casket Letters and Mary Queen of Scots*, 1890, and *Mary Queen of Scots*, 1905; M. Philippon, *Histoire du règne de Marie Stuart*, 1891-2; A. Lang, *Mystery of Mary Stuart*, 1900-4; R. H. Mahon, *Indictment of Mary Queen of Scots*, 1923, *Mary Queen of Scots: a Study of the Lennox Narrative*, 1924, and *The Tragedy of Kirk o' Field*, 1930; and articles by R. Chauvière in the *Revue historique*, vols. clxxiv, 1934, and clxxv, 1935.

Caskets, or **Casquets**, group of rocky is. in the Eng. Channel, 8 m. NW. of Alderney, so named because they look like a helmet. They are very dangerous to shipping; here the *White Ship* was wrecked in 1120, and the *Victory* in 1744, and many other vessels. There is a lighthouse on the C. See Swinburne's poem, *Les Casquettes*.

Casks (wine), see WINE and METROLOGY.

Časlav (Ger. *Tschaslau*), Czechoslovak tn in the region of Pardubice (q.v.). The tomb of Ziska (q.v.) in the church here was destroyed in 1623. Near by is Chotusitz where Frederick II (q.v.) of Prussia defeated the Austrians in 1742.

There are sugar and alcohol industries. Pop. 8800.

Caslon, William (1692-1766), notable typefounder, *b.* Cradley in Worcs. In 1720 he estab. a small business in St Luke's, London, in partnership with Bowyer and some other printers. For many years there were very few books of importance that were printed with any other type than that of C. He took as his model types of the Dutch pattern. The business continued until 1937, when it was acquired by Stephenson, Blake & Co. Ltd. See *Two Centuries of Typefounding*, 1920.

Casoli, It. tn, in Abruzzi e Molise (q.v.), 18 m. SSE. of Chieti (q.v.). It was the scene of much fighting during the Second World War. Pop. 7000.

Casoria, It. tn, in Campania (q.v.), 4 m. NNE. of Naples (q.v.). It has wine and silk industries. Pop. 19,500.

Caspari, Carl Paul (1814-92), Ger. scholar and theologian, *b.* Dessau; was prof. of theology at Christiania from 1857 till his death. He wrote many theological and philological studies, and an Arabic grammar. He also pub. *Quellen zur Geschichte des Taufsymbols und der Glaubensregel*, 1866-75, and *Kirchenhistorische Anekdoten*, 1883.

Caspe, Sp tn in the prov. of Zaragoza, near the junction of the Guadaloupe and the Ebro. Its castle was the scene of the 'Compromise of Caspe' in 1410, by which the delegates of Aragón, Catalonia, and Valencia chose Ferdinand of Antequera as king (see FERDINAND I OF ARAGÓN). There are sulphur springs near by. Pop. 9400.

Casper, second largest city in Wyoming, U.S.A., a rail and distribution centre with large oil refineries, amidst a rich oil, agric., and livestock region. It manufs. tents, torpedoes, bricks, beverages, and awnings. An air force base is near by. The Kendrick project irrigates 66,000 ac. in the vicinity. Pop. 23,673.

Caspian Sea (anc. *Mare Caspium*, or *Mare Hyrcanum*, Gk *Kaspia thalassa*), the largest inland sea in the world, on the boundary between Europe and Asia, extending from 36° 40' to 47° 20' N. lat., and 46° 50' to 55° 10' E. long. Its length from N. to S. is 680 m., and its breadth varies between 130 and 270 m.; total area 170,000 sq. m. It lies mostly in Soviet ter., having Persia on the SW. and S. The present sea formed part of a vast ocean which probably extended at one time to the Arctic Ocean, and united with the Black Sea in the W. More recently the C. and Aral waters constituted a distinct Aralo-C. Sea, traces of whose existence are the high-level terraces (benches) which surround part of the C. shore-line, and deposits of the C. type of fossil shells which are scattered over the Post-Pliocene Karakum sands eastward as far as the meridian of Mary (Merv). The coastline is irregular. The C. has no tides, but its navigation is difficult because of violent storms. Greatest depth in N. basin, 2526 ft. and in S., 3006 ft. Its chief tribs. are the Volga, Ural, Emba, Terck, Kura, and Atrek R.s. Communication with the

Black, Baltic, and White Seas has been estab. by means of canals connecting with the Volga. It abounds in fish, notably salmon and sturgeon, which also supply the caviare and isinglass manufactories on its shores. Many lines of steamers navigate the C., the chief ports being Astrakhan, Baku, Gur'yev, Makhachkala, and Krasnovodsk in Soviet ter., Astara, Meshed-i-Sar, Pahlevi, and Bandar-i-Gaz in Persia.

Casquets, see CASKETS.

Cass, Lewis (1782-1866), Amer. statesman, *b.* Exeter, New Hampshire. He was U.S. marshal for Ohio, 1807-12, and became a colonel in the regular army in 1813, and later a major-general of volunteers. For sev. years he was Governor of Michigan and in the year 1831 was made secretary of war. For a long period he was a senator, and in 1857 he obtained the position of secretary of state, which he held until 1860. Democratic candidate for president in 1848, he was beaten by Gen. Taylor. He wrote a hist. of the traditions and language of the Indians of the U.S.A.

Cassagnac, Bernard Adolphe Granier de (1806-80), Fr. politician and journalist, *b.* Avéron-Bergelle in the dept. of Gers. He started his career in Paris in 1832 as a literary critic, but soon became better known as a fervent Orleanist. Subsequently he became an equally fanatical imperialist. In 1868 he accused the Liberal party of having received money from the King of Prussia, but was unable to produce other than false evidence when called upon to do so. He fled to Belgium in 1870 after the proclamation of the rep., but returned in 1876 for the elections, and was elected deputy.

Cassagnac, Paul Adolphe (1843-1904), Fr. journalist, *b.* Paris, son of Bernard Adolphe C., in early life was associated with his father in politics and in journalism. He joined the army upon the declaration of war in 1870, was taken prisoner at Sedan, and imprisoned for some time in Silesia. He returned to Paris in 1872, once more associated himself with *Le Pays*, the jour. of which his father was editor, and in his articles fanatically upheld the Bonapartist cause against the Royalists and Republicans. In 1876 he was elected deputy for the dept. of Gers. He was the founder of the jour. *L'Audorité*, and wrote a life of Napoleon III. His violent views involved him in numerous gov. prosecutions, and in sev. duels.

Cassana, Niccolò, generally called **Nicoletto** (1659-1714), It. painter, *b.* Venice. The best of his many fine historical paintings, especially 'The Conspiracy of Catiline,' are in the gallery of Florence. He painted a portrait of Queen Anne of England and of various Eng. noblemen. He *d.* in London. His father, who was a pupil of Strozzi, also painted historical subjects, one of his best pictures being 'St Jerome' in the Mirandola church.

Cassander (354-297 BC), son of Antipater (q.v.). His father on his deathbed in 319, appointed Polysperchon

regent of Macedonia and conferred upon C. the inferior dignity of chieftain. Aided by Ptolemy and Antigonos, C. declared war on his hated rival; he took Athens and other Gk cities, invaded Macedonia, and put to death not only Olympias (316), the mother of Alexander, but also (311) the latter's widow Roxana and her son. In 306 C. assumed the title of king, and soon afterwards joined the alliance against Antigonos I. It was not, however, until 301 that the battle of Ipsus gave him control of Macedonia and Greece. He d. of dropsy.

Cassandra, daughter of Priam and Hecuba, loved by Apollo, who promised her the gift of prophecy if she would yield to him. But on obtaining the promised gift, she refused him. Thereupon Apollo added the curse that none of her prophecies should be believed. Vainly she foretold the fall of Troy, in which she was captured, ravished by Ajax Oileus, and afterwards murdered by Clytemnestra.

Cassandra, the anct Pallene, the most W. of the 3 fingers of the Chalcidice Peninsula, between the Gulfs of Salonica and C.

Cassano: 1. (or **Cassano all' Ionio**) It. tn, in Calabria (q.v.), 35 m. NNE. of Cosenza (q.v.). It is overlooked by a castle-crowned rock. There are warm, sulphurous springs in the vicinity. Pop. 8000.

2. (or **Cassano d'Adda**) It. tn, in Lombardy (q.v.), on the Adda (q.v.). It was the scene of 3 battles: a victory of the Guelphs over the Ghibellines (qq.v.) in 1259; a victory of Marshal Vendôme over Prince Eugène (qq.v.) in 1705; and a defeat of the French by the Russians and Austrians in 1799, during the absence of Napoleon (q.v.). Pop. 5000.

Cassano delle Murge, It. tn, in Apulia (q.v.), 16 m. SSW. of Bari (q.v.). Pop. 7000.

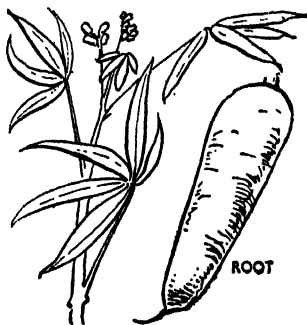
Cassation (*cassare*, in the Lat. of the jurists, to annul, Fr. word denoting 'the reversal of a judicial sentence.' The Cour de C., which received its full organization under Napoleon, became under the Third Rep. the highest tribunal in France. It sits in Paris and hears appeals from all other courts except the administrative courts. It may also receive appeals from courts martial. The court, constituted as the *conseil supérieur* of the magistracy, has power to remove any judge nominated by the president of the rep. It consists of 49 members who, by the charter of Louis XVIII, are appointed by the head of the state, but hold office for life. The members include the first president, 3 sectional presidents, and 45 counsellors with a parquet, i.e. ministerial staff, including a procureur général and 6 advocates-general. The court is divided into 3 sections: (1) Section des Requêtes, which examines whether the petitions or appeals are to be received; (2) Section de C. civile, which decides upon appeals in civil cases; (3) Section de C. criminelle, which decides upon appeals in criminal matters. The court does not decide upon the main question at issue, but only on the competency of the other courts to hear the

particular case; and the legality of the forms and soundness of the legal principle by which the case has been already tried. Thus the functions of the Cour de C. are ordinarily restricted to errors of law and procedure, and strictly it is not a court of appeal at all; but in cases where evidence is adduced before it which was not available in the court below, it may send the case back for a new trial or enter the appropriate judgment. This was the course followed in the Dreyfus case in 1906. If the law is found to have been violated, the decision of the inferior court is annulled and the case sent to be tried again by another court. If this second court decides the case in the same manner as the first, and a petition is again laid before the Cour de C., then the 3 sections unite in order to examine the case anew, and if they in their turn annul the decision, the case is sent to be tried before yet another court. Should this third court decide in the same way as the other courts, and a petition against the decision be again presented to the Cour de C., that court requests a final explanation of the law on the point at issue from the legislature. If the court refuses the demand for a re-hearing its refusal is final. If the court grants the demand the case is heard by the civil section, where, after the point is argued, judgment is granted or refused. Three judges of the Cour de C., elected for 3 years by the other judges of the court, are a constituent part of the Tribunal des Conflits. The institution of the Cour de C. proved highly beneficial to France. Placed by the nature of its office out of the immediate influence of political passions, it has maintained its reputation for strict impartiality throughout all the changes of gov. and administration. Many of the most distinguished jurists of France have been and are numbered among its members.

Cassatt, Mary (1855-1926), Amer. painter, b. Pittsburgh, Pennsylvania. She went to Spain and afterwards to Paris to study art, where she came under the Impressionist influence. She had her first exhibition of paintings in Paris in 1893, and exhibited for many seasons in Paris and New York. She specialised in painting women and children, and ranks high among the followers of the Impressionists. Most of her works have found their way into permanent art collections in the big cities of the U.S.A.

Cassava, **Mandioc**, or **Manioc**, name given to 2 varieties of *Manihot*, a genus of Euphorbiaceae. The plants are shrubs which grow to a height of about 6 ft in tropical S. America, and their various products are very valuable. *M. utilis*, the bitter C., contains a poisonous juice, but when it has been driven off the plant is wholesome; the roots are ground to make mandioc or C. meal, also called Brazilian arrowroot, and the poisonous juice, or cassareep, is used as a condiment and preservative. The roots are also specially prepared to make tapioca. *M. dulcis* var. *api*, the sweet C., has also edible tuberous roots; they are non-poisonous and are grated directly into

food, both for men and cattle. Both varieties are rich in starch.



CASSAVA

Cassel, Sir Ernest (1852-1921), financier and philanthropist, son of Jacob C., a banker in Cologne, where he received his education. He started life in a corn merchant's office in Liverpool, and then went to London. In 1878 he married Annette, daughter of R. T. Maxwell, who d. in 1881. He financed the great Aswan dam in Egypt, also the Swedish railways, and the central London tube railway, which was opened in 1900. He raised a loan for China after the war with Japan, and assisted in the negotiating of 3 state loans for Mexico. In 1902 he presented King Edward VII with £200,000 for the building of sanatoria for consumptives, and in Aug. 1910 he gave another £200,000 for the benefit of poor Eng. people in Germany and the poor Germans in England. He retired from active business in 1910. He was one of the largest subscribers to war loans, and in Sept. 1915 went to America in support of the Anglo-Fr. loan there.

Cassel, Gustav (1866-1945), Swedish economist, educ. at Stockholm and Uppsala, where he took his doctorate in mathematics. Became prof. of political economy at Stockholm Univ. in 1904. Member of the gold delegation of the League of Nations, 1929-32, and, in 1933, Swedish delegate to the monetary and economic conference in London. He was an outstanding figure in economic science during the inter-war period, playing an important part in interpreting the abnormal monetary phenomena of the years between the wars and contributing to the theories of interest and of the trade cycle. His *Theory of Social Economy* (1923) ranks as an outstanding work on economic theory, but he was first and foremost a monetary specialist, and was the leading theoretical expert on foreign exchange during the chaotic period after 1918. After 1914 he advanced the theory that under a system of inconvertible paper currencies the exchange rates tend to represent the ratio between the internal price levels of the

countries concerned; in other words, they tend to adjust themselves towards what he called their 'purchasing power parities.' This conception was regarded as almost revolutionary in face of the old theory according to which exchange rates are determined by the trade balance; but he lived to see the general acceptance of his principle. Other works: *Grundriss einer elementaren Preislehre*, 1899; *Nature and Necessity of Interest*, 1903; *Money and Foreign Exchange after 1914*, 1922; *The Downfall of the Gold Standard*, 1936.

Cassel, see KASSEL.

Cassel, John (1817-65), publisher, b. Manchester. During his apprenticeship to a joiner he studied Eng. literature and the Fr. language, and in 1836 he came to London to work at his trade. He became interested in writing and publishing, and in 1848 he founded the publishing firm which still flourishes under his name. *See* S. Nowell-Smith, *The House of Cassel*, 1958.

Cassia, genus of Leguminosae consisting of about 400 shrubs, trees, and herbaceous plants found in Asia, Africa, and America. The leaves are paripinnate, the flowers zygomorphic, some of the stamens are often reduced to staminodes or absent, and the pods have often a bitter, nauseous taste. Many of the species contain purgative properties, and yield the drug called senna, obtained either from the leaves or from the pulp of the fruit. *C. fistula*, the purging *C.* or pudding-pipe tree, is a small tree with large yellow flowers, in long racemes, having the appearance of a laburnum, and is found wild in India and tropical Africa. This plant yields the *C.* pods or purging *C.* of commerce; *C. acutifolia* and *C. angustifolia* yield the senna sold by chemists. *C. lanceolata*, the Alexandrian senna-plant, is found wild in Arabia, whence it is exported under the name senna of Mecca. *C. marilandica*, the Maryland senna plant, is valued for the purgative properties of its leaves.

Cassia, Via, one of the highways of ancient Italy. It led from Rome through Etruria to Florentia (Florence) and by way of Arretium and Luca. Though the date of its construction and the origin of its name are uncertain, it was evidently a well-known road in Cicero's time (see *Philippics*). In the *Antonine Itinerary* (q.v.) it is confused with the Via Clodia.

Cassia Buds, believed to be the immature fruits of *Cinnamomum cassia*, which yields the aromatic *C.* bark used in the adulteration of cinnamon. In appearance they resemble cloves and in taste cinnamon, for which spice they are often used in confectionery.

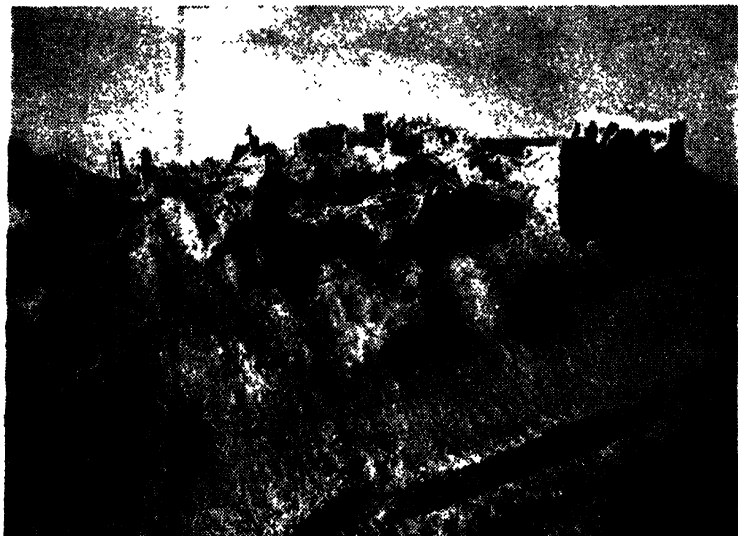
Cassianus, Joannes Eremita, or Joannes Massiliensis (c. 360-448), monk and theologian, one of the first founders of monasteries in W. Europe, usually referred to in English as Cassian. He was probably born in Provence, but spent his early life in a monastery at Bethlehem. With his friend Germanus he went to Egypt, Constantinople, and Marseilles, at which place he founded 2 religious houses, one a convent for nuns, and the other the abbey of St Victor, which is

said to have sheltered 5000 inmates during his lifetime. After his death he was the object of a popular cultus. He wrote *De Institutione Coenobiorum*, and *Collationes Patrum*, treatises on monastic life.

Cassianus Bassus, Gk writer of the 6th cent., to whom have been ascribed *Geoponika*, agric. treatises on rural economy (see GEOPONIC). An ed. with notes and index was pub. by N. Nicolas at Leipzig in 1781. According to Seyffert, however, he was a Bithynian who lived about the middle of the 12th cent. AD

4 generations had charge of the observatory at Paris.

Giovanni Domenico Cassini (1625-1712), b. Perinaldo near Nice, and studied at the Jesuits' College, Genoa. In 1650 he was nominated prof. of astronomy at Bologna Univ. In 1657 he was made inspector of fortifications by Pope Alexander VII, and in 1689 he was made director of Paris Observatory. He determined the rotation periods of Jupiter, Venus, and Mars, discovered 4 of Saturn's satellites, and the div. of that planet's rings, named after him, etc.



Imperial War Museum: Crown Copyright

THE MONASTERY OF MONTE CASSINO, AFTER ITS
DESTRUCTION IN 1944

and undertook the work at the suggestion of Constantine VII.

Cassicus, genus of passeriform birds of the family Icteridae to which belong the Amer. orioles, or starlings. The species are distinguished chiefly by their long, straight, large, and sharply pointed bills. They are gregarious and feed on insects and fruit.

Cassides, group of coleopterous insects of the family Chrysomelidae, are often known as shield- or tortoise-beetles from their habit of withdrawing the head into the thorax. They are smallish, oval in shape, brightly coloured, and often metallic in appearance. The larvae cover their bodies with dried excrement, so as to take from themselves all semblance of insects, e.g. some look like a tiny nest and some seem covered with lichen.

Cassini, name of an It. family of astronomers and geographers, of whom

Jacques Cassini (1677-1756), son of the former, b. Paris, and at the age of 17 admitted as member of the Academy of Sciences. Two years later he was made fellow of the Royal Society of London. In 1712 he succeeded to his father's position, and pursued various researches on the figure and size of the earth, on the rotation of the planets, and on Saturn's rings, which, he suggested, were composed of small particles.

César François Cassini, de Thury (1714-84), son of the preceding, b. Paris, and succeeded to his father's position. He also continued the latter's surveying operations. He began the great topographical map of France, which was later completed by his son.

Jacques Dominique, Comte de Cassini (1748-1845), Fr. mathematician and geographer, b. Paris. He took an active part in the div. of France into depts and

helped to found the institute. He was the last of the line of C.s who had occupied the post of directors of the Paris Observatory for more than 120 years. Owing to difficulties with the authorities he gave up astronomy in 1794 and lived in retirement.

Cassini's Ovals, see OVALS.

Cassino, It. tn, in Lazio (q.v.), 26 m. SE. of Frosinone (q.v.). It is at the foot of the hill on which stands the famous abbey of Monte Cassino (q.v.). The tn was destroyed during the Second World War (see CASSINO, BATTLE OF), and has been reconstructed S. of its former site.

Allies prised the Germans out of the fortified basements of C. prison, and 2 days later Amer. forces held about one-third of the tn. Having discovered that the Germans were using Monte C. as a stronghold, the Allies prepared to bomb the monastery in the hope of removing the strongest enemy defence of the road to Rome and of C. itself; and on 15 Feb. the monastery was subjected to an aerial bombardment, accompanied by an artillery assault on the Ger. positions in and around C. and far back in the Liri valley S. of C. But no decision was reached on the possession



By courtesy of the Italian State Tourist Office

THE MONASTERY OF MONTE CASSINO NOW REBUILT
SINCE ITS DESTRUCTION

There are remains in the vicinity of the Rom. tn of *Casinum*. Pop. (tn) 13,500; (com.) 18,700.

Cassino, Battle of (Feb.-May 1944), protracted battle for the tn of C. and the Benedictine monastery known as Monte C., fought by the Fifth Army of Amer., Brit., and Fr. troops, and later also by troops of the Brit. Eighth Army and some Polish troops, against the Ger. forces under von Kesselring, in the course of the allied invasion of Italy during the Second World War. The Allies having on 1 Feb. crossed the Rapido R., Amer. and Fr. colonial troops of the Fifth Army broke through the Ger. Gustav line—a strongly fortified line running through Castel di Sangro, C., Castelforte, and Minturno—and bore down on C. There followed four house-to-house fighting in the tn, and by 11 Feb. part of it was in ruins. On 13 Feb. the

of C. and the situation remained a stalemate, with only desultory artillery exchanges, until 15 Mar. On that date C. was heavily bombed, the Allies dropping some 1400 tons of bombs on an area of less than 1 sq. m. Immediately the bombing ceased, Brit. and Amer. artillery shelled Ger. positions in and around C., and infantry pressed forward in the C. area, while aircraft bombed enemy centres of communication. On 16 Mar. allied tanks and infantry entered C. and penetrated enemy positions in the hills NW. of the tn. But the Allies found their advance held up by the terrible devastation wrought by the air assault. The Germans took full advantage of the masses of rubble as sites for mortars against Brit. efforts to clear a path for tanks; and thereafter the battle for C. pursued a grim course among the ruins and rubble of the tn. On 17 Mar.

New Zealand forces led an assault on the tn, while Indian forces took some hill positions overlooking it. By now, however, remnants of buildings and masses of debris, much of it resistant to high explosive, had been improvised by the enemy as strong-points and snipers' nests. It was obvious to the Allies, ironically enough, that an immense amount of rapid repair work was necessary to enable tanks and transport to advance at all through C., where there were drains 40 ft deep and full of water. Some progress was made by the New Zealanders on 19 Mar, but such progress as the Allies made was always delusive because the Germans were still in possession of many heights overlooking C. By 26 Mar., though continual and bitter fighting was still in progress, the battle for C. was more or less a stalemate once again, and, for some time, the struggle died down to desultory artillery duels. Throughout the ensuing 6 weeks before the tn fell in May, the allied positions and those of the enemy in the tn were so close upon each other in a series of loosely formed lines—reminiscent of the opposed forces at Stalingrad—that the least observable momentary movement of head or limb generally meant death or wound from snipers. Meanwhile the Brit. command spent the interval in further preparations, regrouping their forces and secretly moving the Eighth Army to the W. side of the front. The Fifth and Eighth Armies resumed the offensive on the whole It. front on 11 May, and the brunt of the most violent fighting fell on the C. sector after large forces had crossed the Rapido R. The Germans again resisted stubbornly, and N. of C. 5 abortive counter-attacks were delivered by them on 14 May. But Brit. troops were now advancing on C. up the Liri valley towards the Via Casilina, and NW. of the tn Polish forces had gained vital positions, while, as part of the general pattern of the offensive, Fr. colonial and Amer. forces were breaking through the Gustav line along the SW. of the front. The Germans defending C. now found themselves in danger of being outflanked by the British and the Poles and so began to withdraw from the Gustav line between the coast and C. while still struggling to keep their hold on the Via Casilina. On 18 May C. fell, at last, to Brit. troops, and the abbey was captured by the Poles. The Via Casilina had been cut and a large proportion of the Ger. 1st Parachute Div. destroyed in its efforts to escape at the last moment. A few prisoners were taken by the incoming Brit. troops, who were faced with a scene of almost total desolation. After the war there was some controversy on the question of whether the destruction of the monastery was an Amer. or a Brit. responsibility, and if, in fact, it could have been avoided. A memorial to the allied soldiers who d. at Monte C. was unveiled in 1956. See Gen. Mark W. Clark, *Calculated Risk*, 1950; F. Majdalany, *Cassino*, 1957.

Cassiodorus, Flavius Magnus Aurelius

(c. 490–c. 585), Rom. historian and statesman, b. Scylaceum in Calabria. He rose to positions of great authority under Theodoric and his successors, being sole consul in 514. About 540 he retired from public life, and probably became a monk. He is a leading contemporary authority for the hist. of the Gothic kingdom of Rome. His most important work, *Variae Epistolae*, contains the decrees of Theodoric and his successors, and his own edicts when chief minister, etc.

Cassiopeia, constellation in the N. hemisphere, not far from the N. Pole and close to Cepheus. In Nov. 1572, according to the observations and records of Tycho Brahe, a new star of great brilliancy was seen here for 10 days. Its brilliancy then diminished, and at the end of 16 months it disappeared. According to the Gk fable, C. was the wife of Cepheus and mother of Andromeda, placed in the heavens with her head from the pole, so as to turn round apparently upside down because, according to Hyginus, she boasted of her own beauty as superior to that of the Nereids.

Cassiterides, group of is. first mentioned by Herodotus as the place where the Phoenicians exchanged their wares for tin. They were fixed to the W. of Spain, and have been identified with the Scilly Is. and Cornwall, or the Brit. Is. as a whole. Others have suggested various small is. off the Sp. coast.

Cassiterite, or Tin-stone, prin. ore of tin, is the dioxide of that metal contaminated with other minerals. Its common name is tin-stone. It is a black or brown crystalline substance, the crystal form being tetragonal prisms terminated by tetragonal pyramids. It has a brilliant adamantine lustre. To obtain the metal from the ore it is crushed and washed and then heated in a furnace with charcoal and lime to remove the oxygen. The metal so obtained is purified by first heating it upon the hearth of a reverberatory furnace until the more fusible tin melts and flows away from the alloys mixed with it as impurities. Afterwards it is stirred with green wood, when the other impurities are carried off with the scum so formed. These consist generally of copper and arsenic. The Malay States (Negri Sembilan, Pahang, Perak, and Selangor), the Dutch E. Indies, and Bolivia supply over three-fourths of the world's tin-ore. The rest is produced chiefly in Cornwall (where the matrix has to be crushed to concentrate the finely divided ore), Siam, China, S. Africa, and Australia.

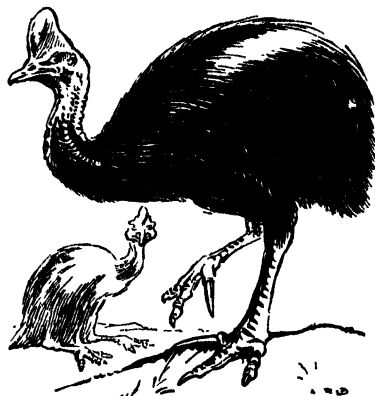
Cassius, Avidius (d. AD 175), Rom. general under Marcus Aurelius (q.v.). He distinguished himself in the Parthian war, and was therefore made military governor of Asia. In 175 Aurelius was ill, and C. proclaimed himself emperor on the strength of a rumour of his death. He was slain by his own soldiers before steps could be taken against him.

Cassius, Galus, called *Parmensis* from Parma, where he was b. He was one of Caesar's murderers, later sided with Antony, and was put to death by order of

Octavian in 30 BC. C. was a poet, and his work was esteemed by Horace.

Cassius Longinus, Gaius: 1. Rom. soldier and politician. In 53 BC he served as quaestor in the Parthian war under M. Licinius Crassus (q.v.), and earned fame by his masterly withdrawal of the remnants of the Rom. forces after Carrhae. He sided with Pompey on the outbreak of civil war in 49, but surrendered to and was pardoned by Caesar after the battle of Pharsalus (48). In 44 he led the conspiracy against Caesar. Following the Ides of March, C. disputed the prov. of Syria with Dolabella, whom he crushed at Caesarea in 43. But in 42 he was himself defeated by Mark Antony at Philippi, and committed suicide.

2. Rom. jurist, Governor of Syria, AD 50, in the reign of Claudius. He was banished by Nero in AD 66, because he had, among his ancestral images, a statue of C., the murderer of Caesar. Recalled by Vespasian. He wrote 10 books on the *ius civile*, and some other works.



CASSOWARY

Cassius Viscellinus, Spurius, Rom. soldier and statesman; sponsor of the first agrarian law. He was 3 times consul, in 502, 493, and 486 BC. His agrarian law so offended the patricians and other wealthy citizens that he was put to death by them: some say the deed was committed by his own father. But according to Mommsen, the story is pure invention.

Cassivellaunus (fl. 54 BC), Brit. chieftain who ruled the dist. N. of the Thames at the time of Caesar's second invasion. After some Brit. successes, Caesar took the camp of C., and the chief was compelled to promise tribute and make submission.

Cassock (Fr. *casaque*), military cloak. Originally the costume worn by soldiers, it was not until a comparatively recent date that the word was used in an eccles. sense. It is a long robe usually buttoned down the front; but the anct style of

Eng. C. was double-breasted and fastened at the shoulder, with a girdle at the waist. In Italy it is called the *solana* (skirt), in France also, a *soulane*. The colour varies according to rank, season, purpose, and in many cases to the regulations of religious orders.

Casson, Lady Lewis Thomas, see THORNDIKE, SYBIL.

Cassowary, or Casuarii, typical genus of the ratite family Casuariidae, which are found only in the Australian regions, and are closely related to the emus. About 6 species exist, which are generally divided into 2 groups, those with the helmet laterally compressed and those with a pyramidal helmet. The plumage of both sexes is a glossy black, the wings and tail are very small, and the hen is larger than the cock. They are running birds with great powers of leaping, and when attacked they kick forward with their feet. They live in pairs in wooded dists, and the cock usually incubates the eggs, about 6 in number, which the hen lays in a nest of leaves and grass. *C. bennetti*, the mooruk, is the most common species.

Cast (moulding), see CASTING.

Cast Iron, see IRON AND STEEL.

Castagno, Andrea del (1423-57), It. painter, b. Castagna, in the dist of Mugello. He was a member of the Florentine school, whose work has a somewhat harsh power. There are works by him in the Castagno Museum, Florence, the cathedral, Florence, and a 'Crucifixion' in the National Gallery is ascribed to him. He d. of the plague at Florence.

Castaldi, Pamfilo (1398-c. 1479), It. poet and humanist, b. Feltre, Lombardy. He founded a school there, which earned great renown among foreign nations, and in which he became the teacher of the It. language and literature. Some It. writers, amongst them Bernardi, say that C. was the real inventor of printing with movable types, and that Johann Fust, who is supposed to have been one of C.'s pupils, and intimate friend, gave away the secret to Gutenberg. It is also alleged that in 1472 Galeazzo Sforza gave C. the authority to establish a printing press at Milan. See J. Bernardi, *P. Castaldi e l'invenzione dei Caratteri Mobili per la Stampa*, 1865.

Castalia, fountain in Greece on Mt Parnassus, sacred to Apollo and the Muses, now the Fountain of St John. It was named after C., daughter of Achelous, who threw herself into it to evade pursuit by Apollo.

Castalion, or Chastellon, Sébastien (1515-63), Swiss Protestant theologian and humanist, b. near Besse. In 1541 he visited Calvin at Strasburg, and the latter made him head of the college at Geneva. He was compelled to leave on account of small differences with Calvin, and lived in great poverty at Basel, till appointed prof. of Greek in 1553.

Castanea, small genus of Fagaceae found in N. lands, the fruit of which is the edible chestnut. In Spain, S. France, and Italy the fruit of *C. sativa* and varieties is eaten raw, roasted, or ground into flour, and is extremely nutritious. The wood

resists well the influence of water, and is well suited for mill-timber, water-works, and palings; the bark is used in tanning. *C. crenata* is the Jap. chestnut; *C. dentata* the Amer. chestnut; and *C. mollissima* is a Chinese species.

Castanets (Fr. *castagnettes*; Sp. *castañuelas*), musical instruments of percussion, introduced into Europe from the E. by the Moors and used in dancing. They are made of 2 hollow shells of chestnut wood (hence the name), fastened together by a cord, which is passed over the thumb and first finger. They are used in pairs, one in each hand, and the 2 shells of each are struck against one another, which produces a series of clicks, thus marking the rhythm of the music.



CASTANETS

Castañas, Don Francisco (Xaver) de, Duke of Bailen (1756-1852), Sp. general, b. Madrid. In early youth he entered the army, and went to Berlin in order to study military tactics under Frederick the Great. In 1808 he defeated 80,000 French under Gen. Dupont de l'Étang at Bailen, but was himself defeated by Lannes at Tudela the same year.

Castanospermum Australe, Australian chestnut, constitutes in itself a genus of the Leguminosae. The plant is a tree 30 to 40 ft high, its foliage affords an excellent shade, and the fruit when roasted resembles a chestnut in flavour.

Caste (from Portuguese *casta*, breed; Lat. *castus*, pure, chaste), term generally employed to denote the div. of Hindu society into various sections or C.s. It has also been employed for any distinctions of class in any nations which have a similar exclusive effect, such as 'colour caste' based on colour differences. It was found strongly marked in Peru, and ancient Persia had its threefold div. of the followers of Ahura Mazda into Atharvas (priests), Rathaesvas (warriors), and Vastryas (husbandmen), as the Zend Avesta tells us. Similar distinctions are even now found in parts of Africa and Polynesia. It is in India that C. is found in its most fully developed form, and here it is most intimately connected with religion. According to a somewhat late hymn of the Rig-veda, possibly interpolated, the origin of the C.s is to be carried back to their birth from Brahma,

when the Brahmans sprang from his head, the Kshatriyas from his arms, the Vaisyas from his thighs, and the Sudras from his feet.

The C. system of India is probably tribal in origin. The Aryans and their retainers gradually resolved themselves into 4 classes: (1) Brahman or priestly C., composed of the *Kishis*, their descendants and disciples, to whom was entrusted the expounding of the Vedas and the conduct of religious ceremonies; (2) the Kshatriya, that is, Rajput or governing and military C., composed of the maharajahs and their warrior kinsmen and companions, whose duty was to rule and fight, and administer justice and protect the community in general. This C. is represented in modern times by the Rajput and the Khattri; (3) the Vaisya, a trading and agric. C. which, assisted by the conquered aborigines, tilled the land, raised cattle, and manuf. the arms and implements and household utensils required by the Aryan commonwealths. This C. is now represented by the Banya. (4) Besides the 3 Aryan C.s, but immeasurably beneath them, there was the servile or Sudra C., composed of captured aborigines whose lives had been spared, and of progeny of marriages between Aryans of different C.s and between Aryans and the women of the country, all of whom, by the rigid exclusiveness of the C. system, came to be regarded as degraded. Every vocation is occupied by its own C. or C.s, which may not marry or even eat with other C.s. But no C. of occupation is general throughout the country, for each prov. has a separate gradation of its own. The one C. that pervades all India is the Brahman, which is subdivided into innumerable sections, between whom there can be no marriage. There are Hindu C.s, such as the Sikh, which have originated as the disciples of religious reformers. Certain C.s, too, claim to be hybrids, having originated from intermarriages between men of a higher and women of a lower C.; thus, for example, the Eurasians, a community of the larger cities, sprang in modern times from alliances between Europeans and Indians. Mixed alliances have not always been prohibited, and the marriage of men with women of lower grades of society (hypergamy) is found. Members of a C. are isolated from all others by their marriage laws, social customs, religious practices, and precedence. Marriage outside the C. is an abomination, while within the C. it is limited by strict rule. Each C. contains groups, and bride and bridegroom should come from different groups. Even in matters of eating and drinking and social intercourse the C. has become an isolated unit, and eating and drinking are ceremonial and symbolic rites. Internal affairs of a C. are controlled by a C. council, which can fine a member for breaches of discipline, and even out-caste him, thus placing him outside society itself. It is generally accepted that the C. system in its present rigidity is a development of comparatively recent Hindu hist., and in the present day the process of C. subdivision still

continues, old C.s producing new as offshoots. The rise of some separate C.s may correspond to a rise in social status, but in other cases the reverse holds good, as when, for example, the Rajputs took to the cultivation of vegetables or the Brahmans used the plough. Amalgamation of different C.s only arises from religious reform, and it is to such influence that the Sikhs owe their separate identity; and this, too, is the explanation of the development of the theistic community which in recent years grew up in Bengal under the name of the Brahma Samaj (q.v.). But apart from these religious revivals, which have had no great effect as consolidating influences, the tendency is still towards the isolation of the C. unit. However, the present awakening of autonomous aspiration, coupled with the demand of educ. Indian women for greater freedom of outlook and opportunity, and the process of urbanisation in India, may modify the rigidity of the C. system.

See E. Thurston, *Castles and Tribes of Southern India*, 1908; K. Mayo, *Mother India*, 1927, 1931; C. S. Ranga Iyer, *Father India: a Reply to 'Mother India'*, 1927; E. Senart, *Castes in India*, 1930; Report of the Simon Commission, 1930; S. S. Nehru, *Castes and Credit in the Rural Area*, 1932; Dr G. Chand, *India's Teeming Millions*, 1939; J. H. Hutton, *Castes in India*, 1946; A. M. Hocart, *Castes: a Comparative Study*, 1950.

Castel di Sangro, It. tn. in Abruzzi e Molise (q.v.), on the Sangro, 55 m. SE. of L'Aquila (q.v.). It has been rebuilt after being severely damaged by Ger. mines during the Second World War. There is a cathedral. Textiles and fireworks are manuf. Pop. 5000.

Castel Gandolfo, It. tn. in Lazio (q.v.), 12 m. SE. of Rome (q.v.). It is situated on a volcanic slope 400 ft above Lake Albano (q.v.). A castle built here by Pope Urban VIII in the 17th cent. was used by the popes as a summer residence until 1870. It reverted to the papacy under the Lateran Treaty (q.v.) of 1929, and is again used as a summer residence. Pop. 4400.

Castel San Giovanni, It. tn. in Emilia-Romagna (q.v.), 13 m. W. of Piacenza (q.v.). Pop. 11,000.

Castel San Pietro, It. tn. in Emilia-Romagna (q.v.), on the Sillaro, 12 m. SE. of Bologna (q.v.). It is a spa, and has a large trade in agric. produce. Pop. 16,000.

Castelar, Emilio (1832-99), Sp. writer and statesman, b. Cadiz, and educ. at Madrid Univ. In 1864 he founded *La Democracia*, in which he wrote bitterly against the gov., and thereby lost his professorship. After an insurrection in 1866 he was condemned to death, but was able to escape to Paris, returning when the revolution of 1868 began. When Alfonso XII was proclaimed King of Spain, he retired into exile for 15 months, and was then elected deputy for Barcelona. The remainder of his life he devoted to the study of hist. and philosophy.

Castelbuono, tn in Sicily (q.v.), 43 m. SE. of Palermo (q.v.). It has an anct Benedictine monastery, and there are mineral springs in the vicinity. Pop. 11,300.

Castelfidardo, It. tn. in the Marche (q.v.), 10 m. S. of Ancona (q.v.). Near by the Piedmontese defeated the papal troops in 1860 (see ITALY, *History*). Pop. (com.) 8000.

Castelfiorentino, It. tn. in Tuscany (q.v.), on the Elsa, 17 m. SW. of Florence (q.v.). It suffered much damage during the Second World War. In the Chapel of the Visitation are fine frescoes by Benozzo Gozzoli (q.v.). Pop. 13,000.

Castelfranco: 1. It. tn. in Emilia-Romagna (q.v.), 7 m. SE. of Modena (q.v.). It has an anct fortress, and fine churches. Matches are manuf. Pop. 16,000.

2. It. tn. in Veneto (q.v.), on the Musone, 15 m. W. of Treviso (q.v.). Once an important fortress, it was the scene of an Austrian defeat by the French in 1805. It has an 18th-cent. cathedral, and was the bp. of Giorgione (q.v.). Textiles are manuf. Pop. 17,000.

Castellammare Adriatico, see PESCARA. **Castellammare del Golfo**, tn in Sicily (q.v.), 19 m. E. of Trapani (q.v.). It is on the NW. coast, on the Gulf of Castellammare, an inlet of the Tyrrhenian Sea (q.v.). It has a trade in cotton, wine, cereals, olive oil, and anchovies. Pop. 17,000.

Castellammare di Stabia, It. fortified port and tourist resort, in Campania (q.v.), on the SE. coast of the Bay of Naples (q.v.), 16 m. SE. of Naples. It was pillaged in the 15th cent. by Pope Pius II (q.v.), and again in 1654 by Henry II of Guise (q.v.). Its name is taken from the castle built here by the Emperor Frederick II (q.v.) in the 13th cent. It has an 18th-cent. cathedral, a naval yard, railway yards, and manufs. of cotton, aeroplanes, and food-stuffs. There are 28 hot springs in the vicinity. The site of the anct Stabiae (q.v.) is near by. Pop. 56,200.

Castellamonte, It. tn. in Piedmont (q.v.), 20 m. N. of Turin (q.v.). It has a school of ceramics, and a trade in agric. produce. Pop. 6000.

Castellan, keeper of a castle in medieval times. In different countries his rank and office varied. In France and Flanders the owners of certain domains held the title, which ranked next to that of bailiff.

Castellana, It. tn. in Apulia (q.v.), 23 m. SE. of Bari (q.v.). Pop. (com.) 12,000.

Castellaneta, It. tn. in Apulia (q.v.), 19 m. NW. of Taranto (q.v.). It has a cathedral. Pop. (com.) 10,000.

Castellazzo Bormida (anct Gamondio), It. tn. in Piedmont (q.v.), 5 m. S. of Alessandria (q.v.). Motor-cyclists hold a rally here every year at the shrine of the Madonna del Cetauri. Pop. 6000.

Castelleone, It. tn. in Lombardy (q.v.), 16 m. NW. of Cremona (q.v.). It has a 15th-cent. church and a 13th-cent. tower, and is an important agric. centre. Pop. 10,000.

Castellesi, Adriano (1460-1521), It. cardinal and writer. Came to England on a papal mission and was made Bishop of Hereford and, later, of Bath and Wells. Recalled to Rome by Pope Alexander VI and made a cardinal. C. was a good Lat. scholar and wrote *De Vera philosophia ex quatuor doctoribus Ecclesiae*, 1507, *De Venatore*, 1512, and *De Sermone latino et modo latine loquendo*, 1513.

Castello, Sebastiano (1513-63), originally Sébastien Châtillon, b. Savoy. He studied at Lyons, and in 1540 became a teacher at Geneva. His religious views, however, did not coincide with those of Calvin, to whom he owed his position, and he was obliged to resign. He went to Basel, 1544, where he was appointed prof. of Greek, 1553, and there he d.

'Castello, De,' see VERGIL, POLYDOR.

Castellón de la Plana: 1. Sp. prov., in Valencia (q.v.), with a coastline on the Mediterranean. It is watered by the Mijares and its tribs., and is fertile and populous on its coastal plains, but barren in the hilly dists. of the interior. The orange groves of this area are well known, and cereals, olives, and almonds are also produced. Area 2497 sq. m.; pop. 323,350.

2. Sp. tn, cap. of the prov. of C. The tn itself is 4 m. from the Mediterranean coast, but it has a port, called El Grao. It has sev. interesting churches, a museum, a library, and beautiful gardens. It manufs. textiles, paper, porcelain, and brandy, and it is surrounded by a fertile irrigated dist. producing oranges, onions, and carobs. Pop. 55,100.

Castelnau, Noël Marie Joseph Édouard, Vicomte de Currières de (1851-1944), Fr. general, b. Saint-Affrique, Aveyron, where he attended the Jesuit school. After taking a science degree at Paris, he entered Saint-Cyr military school in 1869. He became general of div., 1910; assistant chief of staff, 1911. On outbreak of war, 1914, he commanded the Second Army in Lorraine. Afterwards employed between Somme and Oise, and in Champagne, and in Dec. made chief of staff. In Dec. 1915 he was sent on a mission to Salonika. When the Ger. attack was concentrated on Verdun (Feb. 1916) C., sent thither with overriding powers, safeguarded the r. b. of the Meuse. In Jan. 1917 he went on a mission to Russia. The great offensive planned in 1918 was to have taken effect under his command in Nov., but the armistice forestalled this plan. C. later entered the Chamber of Deputies as member for Aveyron (1919-24).

Castelnauudary (Rom. *Sostomagus*, later *Castrum Novum Arianorum*), Fr. tn in the dept of Aude, on the canal du Midi. It commands the gap between the Central Plateau and the Pyrenees, and has been frequently under siege. It was captured by the Black Prince in 1355. There are flour mills and manufs. of pottery, wines, and preserves. Pop. 8100.

Castelnuova, see HERCEGNOVI.

Castelnuovo Berardenga, It. tn, in Tuscany (q.v.), 9 m. E. of Siena (q.v.). Pop. 10,000.

Castelnuovo-Tedesco, Mario (1895-), It. composer, b. Florence. He never held an official post, and in 1939, being a Jew, he was forced by Mussolini's racial laws to leave Italy and settled in the U.S.A., later becoming an Amer. citizen. His works include the operas *La mandragola* (on Machiavelli), *Bacco in Toscana*, and *Aucassin et Nicolette*; 2 ballets, film and choral music; 7 overtures on plays by Shakespeare; violin, piano, cello and guitar concertos; chamber music; instrumental sonatas; piano music and songs, including all those in Shakespeare's plays.

Castelo-Branco, Camilo, Visconde de Correia Botelho (1825-90), Portuguese author, b. Lisbon. Studied in Oporto and Coimbra. Early an orphan bereft of both parents, he began his career of letters in order to gain a livelihood. Later on he went to the Episcopal Seminary in Oporto with the intention of entering the priesthood. He took orders, but his restlessness and want of stability forbade his keeping to one thing for any length of time, and in due course he resumed his former occupation. The best of his imaginative romances, written in the manner of Victor Hugo, are *O Romance de um Homem Rico*, *Retrato de Ricardina*, and *Os mysterios de Lisboa*. Recognised as a master of Portuguese prose style, he asserted himself as a polemicist of acid temper and powerful literary gifts. He was pioneer of novels of Portuguese social life and was excelled only by E. de Queiroz. Among his historical and biographical books are *Noites de Lamego* and *Memorias d'a Bipo do Grão Para*. Created viscount, 1885, in recognition of his service to letters. See Y. P. Coelho, *Introdução ao estudo da novela camiliana*, 1946.

Castelo Branco: 1. Dist. of E. central Portugal, almost co-extensive with Beira Baixa prov. (q.v.). It is bounded on the E. by Spain, on the S. by Spain and the Tagus, and on the NW. by the Serra da Estrela (q.v.). The dist. is mainly agric., but has a woollen industry. The largest tn is Covilhã (q.v.). Area 2588 sq. m.; pop. 320,300.

2. Tn of Portugal, cap. of C. dist. and of Beira Baixa prov., 120 m. NE. of Lisbon (q.v.). It is the seat of a bishopric, and has Rom. remains and the ruins of a castle of the Templars. The tn has a woollen industry, and a trade in agric. produce, cork, wine, and olive oil. Pop. 3900.

Castelo de Vide, tn of Portugal, in Portalegre dist., on the N. slope of the Serra de São Mamede, 9 m. N. of Portalegre (q.v.). It has a 14th-cent. castle and many other old buildings. Olive oil, pottery, and cork are produced. Pop. 3900.

Castelsarrasin, Fr. tn, cap. of an arron., in the dept of Tarn-et-Garonne, on the Canal - Latéral. It has metallurgical industries and manufs. of wooden goods. Pop. 8400.

Castelvetro, tn in Sicily (q.v.), 27 m. SE. of Trapani (q.v.). It has a notable 16th-cent. church. Fine white wines are produced, and there is a timber industry.

The ruins of the anct *Selinus* (q.v.) are 7 m. S. Pop. 29,700.

Casti, Giovanni Battista (1724-1803), It. poet, b. Prato, Tuscany, and early took orders. He taught for some time in the seminary of Montefascone, but then gave up his hope of advancement in the Church and his canonry of the cathedral for the sake of travel. In the service of Joseph II of Austria, he visited most of the European caps., and on his return that monarch gave him the position of *poeta cesareo*, or poet laureate. In later life he resigned this position to avoid political strife, and settled in Paris as a private gentleman, to remain there till his death. His chief works are *Novelle galanti* (1793), a collection of tales in *ottava rima*, of which the plots are chiefly taken from La Fontaine and Boccaccio, and *Gli animali parlanti* (1802), an elaborate poetical allegory.

Castiglion Fiorentino, It. tn, in Tuscany (q.v.), 10 m. SSE. of Arezzo (q.v.). It was severely damaged during the Second World War. It has a castle, and there are notable paintings in the churches and picture gallery. Alcohol, wire, and fire-works are manuf., and there are lignite mines. Pop. (com.) 16,000.

Castiglione, Baldassare (1478-1529), It. statesman and man of letters, b. Casatico, near Mantua, and received his education at Milan. About the year 1500 he entered the service of Guidobaldo da Montefeltro, Duke of Urbino, whose court was one of the best in Italy. This prince sent him on an embassy to Henry VII of England in 1506, and in 1524 he was charged by Pope Clement VII with the difficult task of arranging a dispute between the sovereign pontiff and Charles V. This carried him to Spain, where he was later naturalised and became Bishop of Avila. He d. at Toledo, broken-hearted, it was said, at imputations of treachery which had been made against him. He was universally mourned, and Raphael's painting of him is well known. C.'s greatest claim to fame rests on his book, *Il Cortegiano*, pub. in 1528, which describes, in the form of dialogues, the composition of the ideal courtier. It is one of the noblest expressions of the Renaissance spirit, and has been trans. into most European languages. It is not only a valuable social document, but also a great work of art. See R. Roeder, *The Man of the Renaissance*, 1933; M. Rossi, *B. Castiglione*, 1946; V. Cian, *Un illustre nunzio pontificio del Rinascimento*, *Baldassare Castiglione*, 1951.

Castiglione, Duke of, see AUGEREAU.

Castiglione, Giovanni Benedetto (1616-1670), It. painter of the Genoese school, known in Italy as Il Grechetto (the Little Greek), and in France as Le Bénédette, b. Genoa, and studied under Vandyck. He painted landscapes as well as historical pieces. His etchings are distinguished by light and shade effects. His best-known work is 'The Animals entering the Ark.'

Castiglione, tn in Sicily (q.v.), on the N. slopes of Mt. Etna (q.v.), 27 m. N. of Catania (q.v.). It is noted for the filbert nuts grown in the vicinity. Pop. 15,000.

Castiglione del Lago, It. tn, in Umbria (q.v.), on the W. shore of Lake Trasimeno (q.v.), 17 m. W. of Perugia. It has an anct castle, and suffered considerable damage during the Second World War. Pop. 17,000.

Castiglione delle Stiviere, It. tn, in Lombardy (q.v.), 22 m. NW. of Mantua (q.v.). Napoleon and Augereau (qq.v.) defeated the Austrians here in 1796. Pop. 8,000.

Castile (Sp. *Castilla*), former kingdom of Spain, occupying the central tableland of the peninsula, so named because of the number of its frontier castles. It emerged as a kingdom in the early 11th cent. Alfonso VI (q.v.) united C., León, and Galicia, and captured Toledo from the Moors. This union dissolved, but León and C. were finally united in 1230 by Ferdinand III (q.v.). In 1479 the succession to the throne of Aragon (q.v.) of Ferdinand V (q.v.), who was married to Isabella of C. (q.v.), united C. and Aragon and was the foundation of the kingdom of Spain (see SPAIN, *History*). C. is divided by the Castilian Sierras into old C., or Castilla la Vieja (q.v.), and New C., or Castilla la Nueva (q.v.). The literary language of Spain is Castilian (see SPAIN, *Language and Literature*).

Castilho, Antonio Feliciano, Visconde de (1800-75), Portuguese poet, b. Lisbon. He was blind from the age of 6. In 1821 he pub. *Cartas de Echo e Narciso*, which attracted much attention. *Amor e melancolia*, 1828, *A Primavera*, 1837, and *O Outono*, 1863, the poems on which his reputation stands, paved the way for the Portuguese Romantic movement. During the revolution of 1845 he was obliged to take refuge in the Azores, and did not return to his native land till 1863. His play *Camões*, adapted from the French, was completed in 1849. C. won a high reputation for scholarship. He trans. the *Metamorphoses* of Ovid in 1841, and the *Georgics* of Virgil in 1865, and also Molière, Shakespeare, and Goethe's *Faust*. See the *Memorias* by his son, Julio de C., 1881.

Castilla la Nueva (New Castile), region of Spain, the S. part of Castile (q.v.). It comprises the provs. of Ciudad Real, Cuenca, Guadalajara, Madrid, and Toledo (qq.v.), and extends S. from the Castilian Sierras in the form of a plateau, the average height of which is about 2900 ft. The climate is very harsh. Area 27,985 sq. m.; pop. 3,679,900.

Castilla la Vieja (Old Castile), region of Spain, the N. part of Castile (q.v.), so called because it was the first part to be recovered from the Moors. It comprises the provs. of Avila, Burgos, Logroño, Santander, Segovia, and Soria (qq.v.), and extends N. from the Castilian Sierras in the form of an elevated plateau (2600-3000 ft.). The countryside is very open. Area 18,962 sq. m.; pop. 1,663,000.

Castillejo, Cristóbal de (c. 1494-1556), Sp. poet, b. Ciudad Rodrigo, Salamanca. He was attached to the Emperor Ferdinand I, brother of Charles V, first as a page and later as secretary, and spent many years in Germany. His poems were

first ed. in 1573. He strongly opposed the poetical innovations of the school of Boscán, which sought to introduce Italian metres, such as the sonnet and the *terza rima*, into Sp. literature. His poems, such as *Sermón de amores* and *Diálogo de mujeres*, are written in a gay or satirical vein, and have plenty of verve. See J. L. Nicolay, *The Life and Works of C. de Castillejo*, 1910.

Castillo de Locubín, Sp. mkt tn in the prov. of Jaén. Pop. 7500.

Castillo Solórzano, Don Alonso de (c. 1580-1643), Sp. novelist, remembered chiefly for picaresque stories which have formed the foundation of stories by far better known authors like Le Sage and Scarron. Le Sage's *Gil Blas* is much indebted to C.'s *Las Aventuras del Bachiller Trapaza*; Scarron's *Don Jophet d'Arménie* is based on C.'s *Marqués del Cigarral*, while Thomas Corneille's *Bertrand de Cigarral* is only an imitation of C.'s story. Other works include a Seville romance, *La garduña de Sevilla*, 1634, *Jornadas alegres*, 1626, and *Teresa de Manzanaro*, 1634 (novels); *Las Harpas en Madrid* and *Fiestas del Jardín* (plays).

Castillon (-la-Bataille or -et-Capitoulain), Fr. tn in the dept of Gironde, on the Dordogne. It was the scene of an Eng. defeat in the last battle of the Hundred Years War (q.v.) in July 1453. Near by is the château where Montaigne (q.v.) was b. and d. Pop. 3100.

Casting, name given to the process of manufacturing articles of given shape by pouring a molten substance into moulds and allowing it to solidify and take up the shape of the moulds. The art finds its application in the manuf. of iron C.s (founding) of every description, of statues (in which case bronze is the metal usually employed), of type for printing purposes, of plaster casts, and in a somewhat different manner in the manuf. of china-ware and pottery. The C. of bronze vessels and images is a metallurgical process of great antiquity. It was a well-known art in ancient Egypt, many bronze statues belonging to this period having been discovered. From many passages in the O.T. it is evident that the Israelites were familiar with the arts of metallurgy, vessels and ornaments being cast in bronze for the furnishing of the temple. Little is known, however, of the methods employed by the ancients in the C. of metal articles, and it is probable that the treatment of metal by smiths' work was more common. The manuf. of cast iron is of comparatively recent date, one of the most important uses to which the latter was first put being the manuf. of cannon. In the reign of Elizabeth I several large foundries existed, wood furnaces being exclusively used. Owing to the use of wood as fuel the first foundries were always built near forests, and it is on this account that Sussex became the site of the iron-smelting industry. Although this industry has long been extinct, many relics of it occur in Sussex cottages and farmhouses in the form of old-fashioned fire-grates, originally cast in the locality. Wood

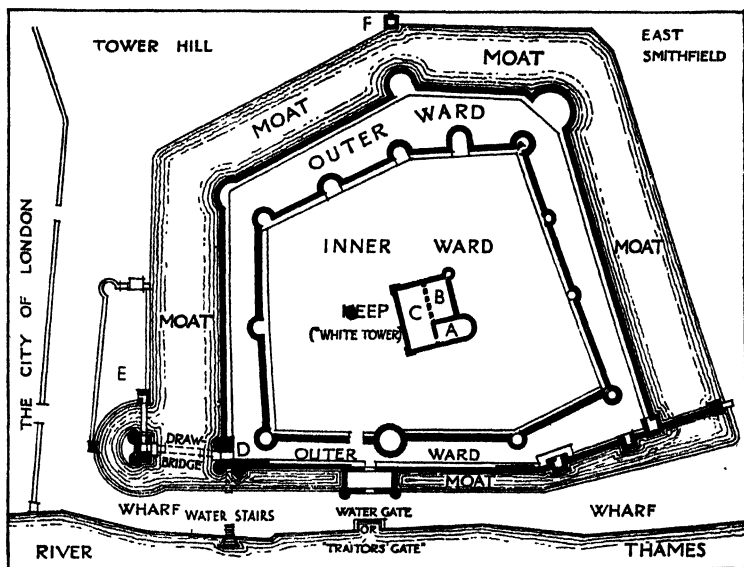
furnaces are particularly well adapted for smelting purposes, as wood does not contain the chemical constituents which cause coal to react in a harmful way with the molten metal.

The increasing demand for cast-iron articles and the limitations of the timber supply, however, resulted in the introduction in the beginning of the 17th cent. of the use of coal for smelting purposes. The iron being reduced from its ores and procured in a molten condition, the process of C. is in brief as follows: To construct a mould it is first necessary to obtain a pattern of the article to be cast, and pattern-making forms of itself an important craft. An exact model of the article to be cast having been made, this is pressed down into sand in a moulding box which has neither top nor bottom. The sand is rammed tightly around it so that on withdrawing the pattern a cavity the exact shape of the article required remains. Often a complicated shape is moulded in 2 moulding boxes placed one upon the other so that on separating the boxes sections of the pattern remain in each box. These sections are withdrawn and the boxes replaced one upon the other as before ready to receive the molten metal. In this case the upper box is called the cope and the lower box the drag. Precautions are taken to ensure the mould's retaining its shape, special qualities of sand or loam being employed, and in the case of large C.s the mould is built up with metal bars. The mould is provided with flues to admit the molten metal and also to allow for the escape of the air displaced by it, the metal being allowed to run in until it overflows the flues. The work is covered with a layer of sand and left to cool and solidify. The mould is then scraped off, and the cast is chased and worked up for the purpose for which it was designed. The principal defects likely to be found in C.s are blow-holes, shrinkage cavities, porous places, and cracking resulting from the trapping of gas in the metal, the use of feeding heads which are too narrow, or excessive ramming of the sand.

The making of patterns is one of the most important crafts connected with the C. industry. The object to be aimed at is the making of a pattern which can be easily taken out from the mould without damaging it. It is evident that in many cases the shape of the pattern would render this impossible were it made in one whole piece. The pattern is therefore carefully constructed in sections, with joints so situated that the parts can be extracted from the mould without fracturing the latter. In many cases a core is used by means of which the thickness of the cast may be regulated. On allowing the molten metal to enter, it fills up the space between core and mould and a cast of the required thickness results. The introduction of *machine moulding*, in which the mould and pattern are manipulated by machinery, has resulted in the attainment of a higher degree of accuracy in the manuf. of C.s than was formerly the case. In *shell moulding* a thin shell mould

is produced by covering a hot metal pattern with a mixture of sand and phenol-formaldehyde resin binder. The thin shell mould may be produced in various ways, i.e. by blowing, sprinkling, or by the use of an inverted box, and the thin mould so formed is then capable of being hardened completely by heating for approximately 3 minutes at 300° C. After baking, the thin sand shell is then lifted from the pattern and 2 such shells are clamped together for C. The advantage of the shell moulding process over the

if the members in a div. are equal, the Speaker must give the C. V., otherwise he never votes. Since 1848 the chairman of a standing committee of the House has been entitled to a C. V. The chairman of a select committee has a C. V., but no other vote. In regard to all questions before private Bill committees the chairman has a second or C. V. In the House of Lords the chairman of committees may record a vote like any ordinary member; he has no C. V., the result being that the question is decided in the



PLAN OF THE TOWER OF LONDON IN THE MIDDLE AGES

A, St John's Chapel; B, C, Guard Rooms; D, Gate Tower; E, Barbican or Outwork; F, End of the (Roman) Wall surrounding London.

ordinary sand moulding technique is the production of C.s of high dimensional accuracy and high surface smoothness. For cast iron see IRON AND STEEL. See also METALLURGY: POTTERY; TYPE AND TYPEFOUNDING. See J. S. Gardner, *Ironwork*, 1927-30, and H. L. Campbell, *Metal Castings*, 1936.

Casting Vote, vote given by the chairman of an assembly when the votes for and against a proposition and resolution are equal, therefore the deciding vote. Where the chairman has already voted he may be entitled to a second or C. V. The privilege is given to the chairman of a bor. council, an urb. or a rural dist. council, and a vestry meeting; and to a person occupying the chair at a meeting, whether the chairman or not, in the case of a par. council or par. meeting under the Local Gov. Acts. In the House of Commons,

negative. See also PARLIAMENT; HOUSE OF COMMONS; HOUSE OF LORDS.

Castle, Egerton (1858-1920), novelist, b. London. He was educ. at the univs. of Paris, Glasgow, and Cambridge; was entered at the Inner Temple; went to Sandhurst and served 3 years with the colours; and represented Britain as an international at fencing. With his wife Agnes he produced a series of romantic novels which include *The Pride of Jennico*, 1898, *The Bath Comedy*, 1900, *The Secret Orchard*, 1901, *The Incomparable Bellairs*, 1904, *If Youth But Knew*, 1905, *The Lost Iphigenia*, 1911, and *The Ways of Miss Barbara*, 1914.

Castle (Lat. *castellum*, *dim.* of *castrum*, a fort; Fr. *châtel*, later *château*; It. *castello*), fortress or fortified building. The term is usually limited to medieval buildings, and in England to those erected

after the Norman Conquest; but is applied loosely to certain ancient strongholds such as Maiden C. in Dorset, fortified c. 350-100 BC. Long before that date, massively fortified palaces such as Tiryns and Mycenae in Greece (see ARCHITECTURE, 1c) had been built of colossal masonry; but at Maiden C. the defences consisted of earthen ramparts and rows of palisades on a naturally strong eminence, difficult of access, and commanding extensive views in all directions. Richborough C. in Kent, Pevensey C. in Sussex, and Portchester C. in Hants are all Roman fortresses built in the 3rd-4th cents. AD as part of

surviving *motte* in England is at Thetford in Norfolk. When a tower came to be erected on the *motte*, it was called the *donjon* or 'keep,' hence the name 'Dane John' at Canterbury. The site of a Norman C. was always carefully chosen for its defensive strength, and was usually on raised ground and, where possible, on the bank of a riv.

Norman C.s in England resembled those erected in France (e.g. Falaise) at about the same period. They are generally classified according to the type of keep: viz. (i) rectangular (C. Hedingham, C. Rising, Dover, London, Middleham, New-



RHUDDLAN CASTLE, FLINTSHIRE, NORTH WALES
An English (or Edwardian) castle built by Edward I in 1277.

a chain known as the 'Forts of the Saxon Shore,' to defend the SE. coasts of England against Saxon incursions.

The building of C.s in England began in earnest immediately after the Norman Conquest, under orders from William I, as a means of establishing stable gov., each under one of his Norman barons; but in some cases a C. became a centre of oppression as well as a refuge in case of hostile risings. Up to 1100, out of some 85 C.s erected in England since 1066, only 6 or 7 were of stone. These included the C.s of London (the White Tower), Pevensey (rebuilt), Colchester, and Richmond (Yorks). All the rest followed the normal types then in vogue: viz. either the *motte* type (the *motte* being not a moat but a truncated conical mound of earth surrounded by a ditch and crowned with a timber palisade) or the '*motte* and bailey' type (i.e. having a *motte* provided with an outer court or bailey, enclosed by walls of earth or stone). The finest

castle upon Tyne, Norwich, Portchester as rebuilt, Rochester, Scarborough); (ii) polygonal (Orford in Suffolk); (iii) circular (Conisborough, Pembroke); (iv) irregular 'shell-keep,' following the natural shape of the site (Arundel, Carisbrooke, Clifford, Exeter, Ludlow, The Peak, and especially Windsor, where the famous 'Round Tower,' which forms the keep proper, owes much of its present height to an extension at the beginning of the 19th cent.).

Among other notable C.s of various types are those at Beaumaris, Caernarvon, Caerphilly, and Harlech in Wales; Edinburgh and Stirling in Scotland; Carrickfergus in N. Ireland. Important Fr. examples are Château Gaillard in Normandy (1196), Carcassonne (11th-13th cents), and Pierrefonds (1390).

The keep, which formed the last refuge of the garrison after the outworks had been captured, also served as the lord's dwelling. It generally had store-rooms

and a dungeon (prison) at ground level. Stone steps led up to the first floor, which was occupied by the soldiers of the garrison, and had very narrow windows or arrow-slits. The next storey was usually higher, and contained the baronial hall where the lord dined with his family and retainers. A chapel was often provided in the keep (e.g. at Dover). Latrines in the thickness of the outer wall (e.g. at Orford) were called *garderobes* (q.v.). The top of a keep was often crowned with crenellated parapets or battlements, consisting of solid portions ('merlions') alternating with narrow openings ('embrasures') through which a defending soldier could shoot arrows while taking cover behind a merlon. Often this crenellated parapet projected on a row of stone corbels or brackets, and between each pair of these was a square hole closed by a lid. When opened the defenders could pour boiling liquids, etc., on to the heads of enemies attempting to mine the base of the wall far below. This arrangement is called 'machicolation' (q.v.), and is one of many military devices learned from the Saracens during the Crusades.

The outer walls of the bailey were also strongly fortified in the same way, and every important entrance gateway was provided with one or more portcullises (q.v.). The outer enclosing wall (*enceinte*) was often furnished with towers or bastions ensuring cross-fire on all parts of the wall; and the entrance to the C., by a drawbridge across a moat, was further defended by an outwork or tower known as the 'barbican' (q.v.). (See also *BARTIZAN* and *POSTERN*.) Somewhere within the C. was a deep well. The military effectiveness of C.s had greatly diminished before the end of the Middle Ages; and those built in the 14th-15th cents. were fortified houses rather than C.s; e.g. Bodiam, 1383; Tattershall and Hurstmonceaux, 1440; Raglan, 1465. Few of the older C.s were convertible into comfortable houses, so many were demolished and the material sold in the 16th cent., e.g. Wallingford. Of the remainder a number were deliberately 'slighted' (i.e. blown up) by both the contending armies during the Civil war of 1642-5. See Sir C. Oman, *Castles* (English and Welsh), 1926; H. Braun, *The English Castle*, 1936; M. S. Briggs, *Goths and Vandals*, 1952; B. H. St. J. O'Neill, *Castles of England and Wales*, 1953; R. A. Brown, *English Medieval Castles*, 1954; S. Toy, *A History of Fortification*, 1955.

Castle Bromwich, dist. of Birmingham, England, on the extreme NE. boundary, and well known for the British Industries Fair, engineering and hardware section, which is held annually in May. The vil. itself is outside the city.

Castle Cary, tn of Somerset, England, 12 m. NE. of Yeovil, manufacturing twine, horse-hair seating, etc. Pop. 1600.

Castle Donington, rural dist., tn and par. of Leics, England, at the confluence of the R.s. Trent and Soar, 7 m. from Ashby-de-la-Zouch. The dist. is still largely agric., though C. D. has a large

hosiery factory, and manufs. of springs, trimmings, and lace. Basket making is also carried on. Pop. (of rural dist.) 9958; (of par.) 3404.

Castle Douglas, burgh and mrkt tn of Kirkcudbrightshire, Scotland, near the border with England, on Carlingwark Loch. The sheep and cattle sales held here are noted. Pop. 3320.

Castle Rising, vil. near King's Lynn, Norfolk, England, and formerly an important tn and seaport. It is notable for the ruins of a fine Norman castle, for a beautiful 12th-cent. church, and for Bede House, founded in 1614 for a few poor women, whose successors even to-day wear the original Jacobean dress. Pop. 200.

Castlebar, co. tn of Mayo, Rep. of Ireland. C. was captured by the Confederate Irish in 1641, and in 1798 the Fr. Gen. Humbert routed the Eng. forces under Gen. Lake in an engagement known since as the 'C. Races.' C. is an important mrkt tn for agric. products, and carries on bacon curing and hat making. Pop. 5300.

Castletown, mrkt tn of co. Monaghan, Rep. of Ireland; on the shores of Lough Muckno. Pop. 2200.

Castlecary, par. of Stirlingshire, Scotland, 6 m. SW. of Falkirk, the site of a fort which defended the Antonine Wall.

Castlecormer, tn of Rep. of Ireland, in the co. of Kilkenny, and 10 m. from the tn of that name. It is situated on the R. Dinin. Pop. 900.

Castleconnell, vil. and spa on the R. Shannon in co. Limerick, Rep. of Ireland, noted for salmon fishing.

Castleford, urb. dist., incorporating Whitwood, in Yorks, England, situated at the confluence of the R.s. Aire and Calder, 10 m. SE. of Leeds. Rom. relics have been discovered within the dist. The Rom. road, Watling Street, passes through C., and the tn is on the site of the Rom. camp formerly known as *Legioilium*. It is a colliery dist., and the centre of chemical, glass, pottery, clothing, and confectionery manufs. Pop. 43,620.

Castlegregory, vil. in co. Kerry, Rep. of Ireland, 15 m. W. of Tralee. The Seven Hogs or Magharee Is. are off the coast of the C. peninsula. Pop. 260.

Castleisleland, par. and tn of co. Kerry, Rep. of Ireland. Pop. (par.) 5000; (tn) 1491.

Castlemaine, Lady, see *CLEVELAND, DUCHES OF*.

Castlemaine, tn of Talbot co., in the state of Victoria, Australia, on Forest Creek, and on the railroad from Melbourne to Echuca. The gold-mines near by were among the first to be opened in the colony. Pop. 6000.

Castlepollard, vil. in co. Westmeath, Rep. of Ireland, 12 m. N. of Mullingar. Pakenham Hall, the residence of Lord Longford, is associated with Maria Edgeworth. The fort near by is the site of numerous early Christian antiquities. Pop. 500.

Castlereagh, mrkt tn, co. Roscommon, Rep. of Ireland. Pop. 1244.

Castlereagh, Robert Stewart, Viscount,

2nd Marquess of Londonderry (1769-1822), statesman. He was the second son of Robert, 1st Marquess of Londonderry, and was educ. at St John's College, Cambridge. He sat in the Irish Parliament in 1790, and entered the Brit. House of Commons in 1794. He was appointed keeper of the privy seal in 1797, and chief secretary for Ireland in 1798. C. actively supported Pitt in bringing about the union between England and Ireland. He was secretary of state for war, 1805-6. On the death of Pitt, he resumed office under Portland. The failure of the Walcheren expedition (1809) brought about a quarrel between C. and Canning, the foreign secretary, which resulted in their retirement from office, and in the duel which took place the latter was wounded. In 1812 C. became foreign secretary under Lord Liverpool; it was during his period of office that Wellington won his brilliant victories, the success of the campaign of 1812-14 being largely due to C.'s steadfast and energetic policy. He represented England at the Congress of Vienna (1814-1815), the treaty of Paris (1815), and the treaty of Aix-la-Chapelle (1818). Though his foreign policy after 1815 was based on non-intervention, so that he refused to help Metternich in crushing European liberal movements, at home he was popularly regarded as a tyrant and considered responsible for the 'Peterloo massacre' and the 'Six Acts' (1819). He eventually committed suicide. As his coffin was being carried to Westminster Abbey a shout of joy came from the crowd in the streets. C.'s position as one of England's greatest foreign secretaries has subsequently been generally recognised. See lives by Lady Londonderry, 1904, and J. A. R. Marriott, 1936. See also C. K. Webster, *The Foreign Policy of Castlereagh*, 1931, and H. M. Hyde, *The Rise of Castlereagh*, 1933.

Castleton, vil. in Derbyshire, England, 16 m. W. of Sheffield. It is situated at the foot of a hill, on the summit of which stands Peak Castle, erected by Wm Peveril, the natural son of William the Conqueror. In the neighbourhood are Peak and Speedwell Caverns and the Blue John Mine. Notable also for its fluorspar. Pop. 650.

Castletown, formerly the cap. of the Isle of Man; in the extreme S. of the is., on the W. coast of C. Bay, 9 m. SW. of Douglas. From a rock in the centre of the tn rises Castle Rushen, said to have been erected in 960 by Guthred II of the Orrys kings of Man. It was once the residence of kings, and was besieged for 6 months by Robert Bruce in 1313. The Isle of Man Airport lies immediately on the tn boundaries. King William's College, in the vicinity, is a noted school for boys. C. is a popular resort for tourists. Pop. (1954) 1800.

Castletown Bere, tn in W. co. Cork, Rep. of Ireland, in Berehaven, Bantry Bay. Opposite the tn is Bere Is., largest is. off Cork coast. Pop. 648.

Castor, abbreviation for **Castoreum** (Gk *kastôr*, beaver), reddish-brown substance

obtained from the beaver, being contained in 2 pear-shaped pouches near the organs of reproduction. It contains a crystalline substance **castorin**, salicin, benzoic acid, and other substances, has a bitter taste and a strong, penetrating, and enduring odour. Formerly it was much esteemed as a medicine, being used in the form of a tincture as a stimulant and antispasmodic, but it is now used only in perfumery as a fixative. See also **PERFUMERY**.

Castor (Alpha Geminorum), fainter of the 2 bright stars in the head of the Twins. It is thought that C. has decreased in brilliance since the stars received their Gk names and this would explain why Alpha, which was used to denote the brightest star, was given to Castor—now fainter than Pollux. It is a very fine double, the component stars, magnitudes 2.7 and 3.7, about 6" apart, giving a greenish light, and being easily seen through a small telescope. Actually C. is a binary, the period of revolution being about 350 years. Each component is a spectroscopic binary, with periods of 3 and 5 days respectively. A third faint star which is also a close binary forms part of the same system.

Castor and Pollux (Gk *Polydeuces*), twin gods of Greece and Rome, known as the Dioscuri. Homer makes them the sons of Leda and Tyndareus, King of Lacedaemon, and brothers of Helen and Clytemnestra. In another version, Zeus embraced Leda in the form of a swan, and she bore 2 eggs, from one of which came Pollux and Helen, children of Zeus, and from the other Castor and Clytemnestra, children of Tyndareus. Pollux was immortal, while Castor was subject to old age, sickness, and death. They were Argonauts, and Pollux slew Amycus, and so became famous as a boxer and wrestler. Castor was renowned for his horsemanship. They fought the Athenians to recover their sister Helen, when carried away by Theseus. C. and P. seized the intended brides of Lynceus and Idas, sons of Aphareus, and in the ensuing battle Castor was slain by Idas. Pollux thereupon killed both the Apharidae, and besought Zeus to grant immortality to his brother. Zeus allowed them to share immortality, each dwelling in the abode of gods on alternate days. It was also said that Zeus placed them among the stars as Gemini. They were worshipped as protectors of sailors. The Romans ascribed to them the victory at Regillus, and built them a temple opposite that of Vesta. They were always represented as riding white steeds, with a star shining on their helmets. See J. Rendel Harris, *The Cult of the Heavenly Twins*, 1906.

Castor Oil is obtained from the seeds or 'beans' of the plant *Ricinus communis*, which grows wild in most tropical and sub-tropical regions, but is cultivated mainly in Brazil and India. The seeds, containing 40-50 per cent of oil, are first 'cold pressed' in hydraulic presses to remove a portion of the oil for medicinal purposes, and the cake residue is solvent-extracted to recover most of the remaining

oil for a variety of industrial uses. It is used in medicine as a safe non-irritating purgative, particularly suitable for young children. It should not, however, be given for constipation, especially when this is accompanied by abdominal pain, except on medical advice. The dose varies from a teaspoon to 2 tablespoons, and as the cheaper varieties have a disagreeable taste, it is generally advisable to mix it with something more palatable, such as milk or lemon juice. Apart from its medicinal use, it is a raw material from which is derived sodium ricinoleate, used for treatment of gum troubles. C. O. is used industrially for soap-making, as a high-temp. lubricant, in fluids for hydraulic systems, and in the manuf. of plastics; it is sulphated to give a product called 'Turkey Red Oil,' for use in the textile industry, and it is dehydrated by heating with a catalyst to produce a drying oil for use in the preparation of paints, varnishes, inks, linoleum, and oilcloth. It is also used as a raw material for chemical manuf., notably of sebacic acid and sev. aldehydes of strong odour for use in perfumery. The main fatty acid constituent of the oil is ricinoleic (82-8 per cent), the only fatty acid in nature having an attached hydroxyl group. The residue cake or meal is unfit for cattle food, as it contains a poison named 'ricine' and is used almost exclusively as a fertiliser. It has been shown that it can be detoxified in case of need for use in dairy foods, and quantities have been used for this purpose, but it is not common practice.

Castor Ware, variety of Rom. pottery made on the Continent but chiefly in the region of Castor, Northants. It has usually a black or brown polished surface with an applied slip ornament of animals or naturalistic scroll pattern, and the most common shape is the bulbous beaker. In the Castor dist. it was made from late in the 2nd cent. until the end of the Rom. occupation.

Castoreum, see **CASTOR**.

Castoridae, name of the third family of the sub-order *Simplicidentata* of the rodents. It contains a simple living genus, *Castor*, the beaver, one species of which is European, the other N. Amer. Many extinct forms of this family are found as fossils.

Castration, operation of removing the testicles or reproductive organs of the male for various purposes. In human beings it is generally performed when these organs are injured or diseased, while in the E. it is a precautionary measure practised on slaves destined to become eunuchs or guardians of the harem or seraglio. The operation is also performed on horses, pigs, sheep, and cattle. The effect is much the same in all male animals treated in this manner. If it is done before puberty the masculine qualities are not developed. In human males the voice does not break nor the hair grow upon the face; in sheep and cattle the horns are either not formed or they take a shape similar to those possessed by females. A castrated cock does not crow,

and its feathers are changed in character. Reproduction is quite impossible. If the operation is performed after puberty, it is often dangerous in its effects; the change is slow in the masculine qualities, and procreative power is not immediately lost. It was in the 17th cent. that the Sistine Chapel in Rome substituted *castrati* for the imported adult male sopranos or 'falsettists' of Spain, whose effects were obtained by some process which is now unknown. The artificial male soprano or *contralto* was obtained by an operation in boyhood on the sexual organs which hindered the development of some of the characteristics of manhood and thereby perpetuated the boy's type of voice. Perhaps the most celebrated *castrato* singer of all time was Farinelli (q.v.). C. is sometimes carried out in modern surgery as a treatment for cancer of the prostate gland (see **CANCER**).

Castén, Mathias Alexander (1813-52), Finnish linguist and ethnologist. In the years 1838, 1839, and 1841 he journeyed through Lapland collecting lexicographical notes. In 1841 he was invited by the St Petersburg Academy to take part in an expedition to Siberia for the study of Samoyed language and ethnology. In spite of tuberculosis, he travelled to Siberia in 1845 and for 4 years collected there vast scientific material. He returned to St Petersburg physically exhausted, but his health improved and in 1851 he was appointed prof. of Finnish at Helsingfors Univ.; soon afterwards he d. Main works: *Dissertatio academica de affinitate declinationum in lingua fennica, ethonica et lapponica*, 1839; *De nominum declinatione in lingua syriana*, 1844; grammars of the Syryan (1844), Cheremiss (1845), Ostyak (1849), Samoyed (1854) languages. After his death, the material by him collected in Siberia was pub. partly in Helsingfors (in Swedish, 6 vols., 1852-8, 1870) and partly in St Petersburg (in Ger., 12 vols.).

Castrense Peculium (Lat. *peculium*) literally denoted property in cattle (from *pecus*, cattle), but came to be used of the private property of a wife, or that which is given by a father or master to his child or slave. According to Rom. law a man had no property independently of his father, but C. P., that is, money acquired by military service (Lat. *castra*, a camp), was regarded as the private property of a son. Later a man was allowed to be sole possessor of any professional earnings, and of property inherited through his mother, in which cases it was known as quasi-C. P.

Castres, Fr. tn, cap. of an arron., in the dept of Tarn, on the Agout. It grew up around a 7th-cent. Benedictine abbey, possibly on the site of a Rom. camp (*castra*). In the 16th cent. it was a Huguenot (q.v.) stronghold. There are textile, metallurgical, mechanical, and pottery industries. Dacier and Jaurès (qq.v.) were b. here. Pop. 30,800.

Castries, cap. of the is. of St Lucia, Brit. W. Indies, situated in Carenage Bay. The port of C. is one of the best harbours in the W. Indies, being land-locked and

providing facilities for fuelling and watering ships and for loading and discharging cargo which are unequalled in those is. C. handles about 945,000 gross tons of shipping annually, and has a large trade in sugar, coco-nut products, bananas, and cacao. The tn was largely destroyed by fire on the night of 19 June 1948. There was no loss of life, but some 20,000 people were made homeless. Rebuilding, in which the high level of the water table posed special problems, was completed in 1952. The estimated pop. of C. (excluding the dist.) is 8600.

Castro, Alfonso (c. 1495-1558), Sp. theologian, b. Zamora. He entered the Franciscan order, and became private chaplain to Philip II, whom he accompanied to England in 1554 for the purpose of negotiating a marriage between that monarch and Queen Mary. He wrote a Lat. work on heresy, entitled *Adversus omnes haereses libri xiv*, 1534. His pub. sermons on heretics include *De justa haereticorum punitione*, 1547, and *De potestate legis poenalis*, 1550. C. became Archbishop of Compostella, 1557.

Castro, Cipriano, or Cypriano (c. 1858-1924), Venezuelan military leader and president, b. in the Andean prov. of Tachira. His parents were Sp. mestizos of the peasant class. He early took an active part in local politics in Capacho as a Liberal, forming a party called 'Castristas.' In 1866 C. was successful in the 'battle of Capacho' against Morales, who was local representative of the López gov. In 1899 C. headed a rebellion against President Andrade. After engagements in Las Pilas, at Zumbador, and San Cristóbal, he pushed his way on to the cap., Caracas. Andrade fled to Curaçao, and C. declared himself *jefe supremo* (supreme military leader). He was made provisional president of Venezuela by the constituent assembly (1901), and in 1902 was formally elected president for 6 years. His administration was marked by numerous uprisings, first that of Hernández, then that of Peraza, and finally that headed by Matos (1902-3), who tried to win the support of foreign govts. C. went to Europe in Dec. 1908, leaving his powers in the hands of the vice-president Gómez, who seized the presidency in 1909, and was popularly confirmed. In 1913 C. unsuccessfully tried to regain power. He remained a wanderer, chiefly in Germany. He d. at San Juan (Puerto Rico).

Castro, Inez de (d. 1355), Sp. noblewoman, whose sad story has been used by poets and dramatists. In 1340 she lived with her cousin, Costança de Paza, the betrothed wife of Dom Pedro, the son of Alfonso IV of Portugal (q.v.). On the death of her cousin in 1345, she secretly married Dom Pedro. Alfonso, fearing that this union would be injurious to Ferdinand, the young son of Costança, ordered her to be put to death. When Dom Pedro ascended the throne in 1357 he avenged her death and, according to one tradition, ordered his nobles to pay homage to her exhumed body. See COIMBRA. See also Camoens, *Lusiadas*.

Castro, João (Juan) de (1500-48), Portuguese admiral, b. Lisbon, the son of Alvaro de C., Governor of Lisbon. He had the same tutor as Emanuel I's son, the Infant Dom Luis, who had a life-long attachment for his young playmate. They were both present at the siege of Tunis in 1535. Upon his return to Lisbon C. received from the king a commission for the command of San Pablo de Salvaterra in 1538. C. was a man always contented with small means, but thirsted to do deeds of bravery and married a noble Portuguese lady who was equally indifferent to wealth. He sailed to the Indies and joined the *aventureros* for the relief of Diu. In 1543 C. undertook the task of clearing the sea of pirates, and later on again he was sent out to the Indies, where he ultimately received the appointment of viceroy, but d. soon afterwards.

Castro, José Maria Ferreira de (1901-), Portuguese novelist who is considered the pioneer of the 'new realist' movement in the country. A former journalist, he brought to the novel a racy and vivid style. *Emigrantes*, 1927, and *A Selva*, 1929, in which he exposes a case of hard conditions of labour in the Brazilian jungle, estab. his literary reputation. See *Jungle* (trans.), 1934.

Castro, i.e. 'castle,' name given to the chief tns of certain is. in the Gk Archipelago, e.g. Lemnos, otherwise known by the name of the is.

Castro del Río, Sp. tn in the prov. of Córdoba, on the r. b. of the Guadajoz. Part of the old walls and a Moorish castle remain. There are manufs. of woollens, leather, and earthenware. Pop. 14,000.

Castro Urdiales (Rom. Flaviobriga), Sp. port in the prov. of Santander, on the Bay of Biscay. It has a ruined Templars' castle, and fisheries. Pop. 12,000.

Castro y Bellvis, Guillén de (1569-1631), Sp. dramatist, b. Valencia, chiefly famous for his *Las Mocedades del Cid*, the source of Corneille's masterpiece. From 1619 he lived at Madrid, and was very friendly with the famous Sp. dramatist Lope de Vega, to whom he was greatly indebted for his style. He wrote some 40 plays, chief among which may be reckoned his *Pagar en propia Moneda* and *La Justicia en la Piedad*. C. has the characteristics of the Sp. writers of romance. His style is vigorous and passionate, and there is the romantic atmosphere so peculiar to the old Sp. *romanceros*. He d. in great poverty.

Castrogiovanni, see ENNA.

Castroreale, tn in Sicily (q.v.), 19 m. SW. of Messina (q.v.). It has hot sulphur springs. Pop. 9400.

Castrovillari, It. tn, in Calabria (q.v.), in the fertile valley of the Coscile, 35 m. N. of Cosenza (q.v.). It has a trade in agric. produce and olive oil, and casks are manuf. Pop. 13,800.

Castruccio Castracani (1281-1328), It. general and soldier of fortune, b. of noble family in Lucca. In the early years of his career he served successively in France, England, and Lombardy. He was a staunch Ghibelline, and the people of

Lucca made him the chief of their rep. In return for his services as adviser in his campaign against the Guelphs, the Emperor Louis of Bavaria made him Duke of Lucca, Pistoja, Volterra, and Lunigiana, as well as count palatine. At the head of the Ghibelline party he carried on a war against the Florentines for 15 years, at the end of which he d., on the very point of winning for himself a magnificent position as supreme authority in Tuscany, 1329. His death was a fatal blow to the Ghibelline party in Italy. Machiavelli's book, *Castruccio Castracani*, is more a work of imagination than a hist. of facts.

Castrum Lucii, see CHALUS.

Castrum Novum Arianorum, see CASTEL-NAUDARY.

Castuera, Sp. tn in the prov. of Badajoz, with a trade in wine and fruit. Pop. 8000.

Castulo, see LINARES.

Casualties. In Scots law 'C. of superiority,' now virtually obsolete, were certain occasional payments analogous to ancient feudal dues, paid to the superior lord by a feuar for the recognition of his tenancy. The only C. that survived until recent times were those payable to the superior in consequence of the transmission of the feu (feud or tenancy) by sale or succession to a new vassal. The payment made by an heir on taking up his estate was known as a casualty of relief (Lat. *relevare*, to take up). The Conveyancing Act, 1874, made C. fixed, and not 'casual' or accidental, payments in the absence of express stipulation to the contrary. C. were abolished by the Feudal Casualties (Scotland) Act, 1914.

Casualties in the First World War (1914-1918). 1. *British Empire Casualties:* The total number of officers and men of the Brit. Empire forces who lost their lives in

and through the First World War was approximately 1,089,900, of whom 1,048,850 were military C. and 41,050 were naval. These C. were distributed as shown below.

The number of wounded was approximately 2,401,000, and the number of prisoners was approximately 191,650. The 'missing' naturally presented a problem in a war which in the character and extent of its operations had no precedent. There were, at the armistice, about 130,000 cases of Brit. officers and other ranks of whom no trace had, till then, been found; but as a result of the excavation work carried on in the war areas, some 70,000 of the bodies were found during the first decade after the armistice. In spite of the scale on which operations were conducted, it is certain that few if any cases are on record of any man returning after being officially posted as dead. A year or two after the armistice the great majority of the 'missing' were, though not till after exhaustive inquiry, 'presumed dead,' and their names accordingly transferred to the official rolls of the dead.

Comparative figures of Brit. and Ger. C. on the Brit. sector of the W. front during the 4 years of hostilities, as compiled with the aid of the Federal Archives at Potsdam, give the following results: (i) the total Brit. officer C. were 115,741; Ger., 47,256; i.e. British: German = 5:2; (ii) Brit. other ranks, 2,325,932; Ger., 1,633,140; i.e. British: German = 3:2; (iii) total Brit. C. to all ranks during the period in question was 2,441,673; Ger., 1,680,396; i.e. British: German = 3:2.

(See *Statistics of the Military Effort of the British Empire during the Great War*, issued by the War Office in Mar. 1922, a detailed but incomplete document.)

1. British Empire Dead:

Brit. Isles (including Ireland)	812,300
Indian Empire (Brit. and Indian)	73,450
Dominion of Canada	62,800
Commonwealth of Australia	60,450
Dominion of New Zealand	18,200
Union of S. Africa	9,050
Newfoundland	1,600
Colonies	52,050
Total	1,089,900

2. Allied and Associated Nations' Casualties:

	<i>Killed and Died</i>	<i>Wounded</i>
France	1,393,388	1,490,000
Belgium	38,172	44,686
Italy	460,000	947,000
Serbia	127,535	133,148
Rumania	335,706	not recorded
U.S.A.	115,660	205,690
Portugal	7,222	13,751

3. Central Empires' Casualties:

	<i>Killed and Died</i>	<i>Wounded</i>
Germany	2,050,466	4,202,028
Austria and Hungary	1,200,000	3,620,000
Bulgaria	101,224	152,400
Turkey	300,000	570,000

(The figures for Turkey are approximate.)

Casualties in the Second World War (1939-45). 1. To *All Ranks of the Armed Forces of the British Commonwealth and Empire, reported from 3 Sept. 1939 to the End of the War, excluding Deaths from Natural Causes*: This statement gives the total number of C. reported up to 14 Aug. 1945. It includes all men reported prisoners of war and, in the case of the armed forces of the U.K., New Zealand, S. Africa, and the colonies, all men reported missing during the war. The figures exclude (i) civilian C. due to enemy action, (ii) C. to merchant seamen, and (iii) C. to members of the Home Guard while on duty.

The total number of officers and men of the Brit. Empire forces who lost their lives in and through the Second World War was 373,372. These C. were distributed as shown below.

The number of missing was 91,000 and the number of prisoners, including service internees, was 326,000. The figure includes 20,000 officers and other ranks missing but presumed to be prisoners of war, and prisoners of war who were repatriated or liberated or who escaped.

2. *Casualties to Merchant Seamen, reported from 3 Sept. 1939 to End of War*:

Deaths	30,248
Missing	4,854
Wounded	4,707
Internees	5,720

Total 45,529

3. *Casualties of the United States Armed Forces between 7 Dec. 1941 and 31 Dec. 1946*. Department of Defence statistics list the number of deaths as 414,000, of which 295,000 were incurred in battle, and the total number of wounded as 670,000.

4. *U.S.S.R.* No reliable figures exist for Soviet C. It is generally considered that the military dead must have been at least over 4,000,000, while civilian losses were equally heavy.

5. *Enemy Casualties during the Second World War*. There are no completely accurate figures for Ger. and Jap. C. Ger. military dead have been estimated as over 2,100,000. In addition, a further 2,900,000 men were listed as captured or missing, and of these a large proportion were almost certainly killed. There were over 4,000,000 wounded. Jap. killed have been estimated at nearly 1,175,000; their wounded at over 4,600,000. The Italians lost 389,000 killed and over 200,000 men were reported missing.

Casuarinaceae, Australian family of Dicotyledons containing the single genus *Casuarina*. The species are trees somewhat resembling the *Equisetum* in appearance, the branches being all long, drooping, green, and wiry, with channelled interodes and very small, scale-like sheaths in place of leaves. The flowers are in male and female catkins, the male flower consisting of a single stamen and 2 perianth-leaves, while the female consists of 2 syncarpous carpels, which form a unilocular ovary. The stamens and styles both hang out over their bracts and are wind-pollinated. The male flowers are borne in terminal spikes and the females resemble a pinecone in appearance. The wood of the plants is called beef-wood, and young shoots afford fodder for cattle. Also known as Sheokes.

Casuarus, see **CASSOWARY**.

Casuistry (Lat. *casus*, instance, point of law), art of bringing moral principles to bear in particular cases—applied morality. From the 7th to the 11th cent. *The Penitential Book* was used as a guide for conscience. Moral theology began with the schoolmen of the 13th cent., and has steadily developed ever since. C. is also used in a derogatory sense to denote sophistical or false reasoning in moral matters, particularly that kind which makes for laxity of conscience. See Pascal, *Les Lettres Provinciales*, 1656-7; H. Sidgwick, *History of Ethics*, 1892; H. Rashdall, *Theory of Good and Evil*, 1907.

Casus Belli (Lat. 'cause of war'), grounds which, by international law, are sufficient for declaring war. The causes for war were strictly defined, so that war might be used as the last extremity in conflicts between nations. See HAGUE CONFERENCE and INTERNATIONAL LAW.

Cat, Christopher (fl. 1702-33), keeper of the Cat and Fiddle Inn, London, and, subsequently, of the Fountain Tavern, in which the Kit-Cat Club (q.v.) held its meetings, 1703-20.

Cat, in general, any member of the mammalian family Felidae, including the lion, tiger, panther, leopard, lynx, jaguar, etc., but the name is more usually limited to the smaller species. Cs. are typical aeluroid, carnivores, distinguished by wonderful flexibility and strength of spine, perfect mechanism of the claws, a small, supple head, looseness of skin, swiftness of movement, grace, and muscularity. They are mostly splendid climbers and jumpers. They have 30 teeth, rough tongues, and long whiskers or feelers

British Dead in the Second World War

United Kingdom	264,443*
Canada	37,476
Australia	23,365
New Zealand	10,033
S. Africa	6,840
India	24,338
Colonies	6,877

Total 373,372

* Excluding women's services: *W.R.N.S.*, 102; *A.T.S. and Army Nurses*, 335; *W.A.A.F.*, 187.

(*vibrissae*), to assist the eyesight at night. The pupils of their eyes expand and contract according to the light about them. The origin of the domestic C. is not certainly known, but it is probably descended from the *Felis ocreata* of ancient Egypt, which was worshipped at a very early period as an object of veneration. C.s are more prone than dogs to revert to a wild or semi-wild state, but no true wild species exactly resembles them. They are hardly mentioned in ancient writers of Greece, Rome, or Judaea, and it is known that in the earlier medieval period of



BLUE PERSIAN

T. Fall

Europe C.s were rather rare and costly. They have been long known in China (from AD 500), whence comes a fine variety with soft, beautiful fur and pendulous tufted ears. The Manx, with merely a rudimentary tail, is supposed to have come from Japan, but is also called the Cornish C. In the widest sense the C. section (*Aeluroidea*) of carnivores includes, besides *Felidae*, civets (*Viverridae*), aardwolves, and hyaenas (*Hyaenidae*). Of domestic C.s the most fancied breed is the long-haired (Persian). The most valued are of a very uniform pale silver or chinchilla colour, without marking or shading, and with green eyes, but to-day the championship award generally goes to a blue or cream, while the blue bring the highest prices and command the highest fees. Blue Persians should have deep orange or amber eyes. Other popular varieties are pure whites with blue eyes, deep coal-blacks with dark yellow eyes, red tabby, Siamese (tawn), brown tabby, and silver tabby. They

may also be tortoiseshell or smoke colour. Markings are an important point in judging short-haired varieties. Usually there is little difference between males and females. Pure sandy C.s are nearly always males. They are difficult to train and inclined by nature to be treacherous. Anger is shown by lashing of the tail, pleasure by a deep, rumbling purr in the throat. Russia, Iceland, India, Madagascar, and Ethiopia all have fine breeds of domestic C. Notable varieties are the Angora (long-haired), Maltese and Chartreuse (bluish-slate colour), Siamese (pale cream, with feet, lower legs, muzzle, and ears all black), and the Paraguay domestic C. of America. As a race C.s are not gregarious or co-operative, but prefer to live or hunt alone (see Kipling's *Just So Stories*, 'The Cat that Walked by Himself'), or in small family parties. The small species (especially the domestic C.) have young very frequently, often as many as 4 or 5 at a birth. For about 10 days after birth a kitten's eyes remain unopened. The eyes are always blue at first changing gradually later on to green or yellow in most varieties. C.s soon grow attached to particular spots or corners of a house. They are good mousers if not spoiled by too much petting. Most kinds are not very affectionate. In Persians the kittens' playfulness gives place to extreme dignity. C.s should be given 2 meals a day; the diet consisting of meat, rabbit, cooked fish, or fowl, bread scraps soaked in milk, and cooked green vegetables. Cooking of certain meats or offal is necessary because of the possibility of worm infestation. Small bones should be avoided. Water should always be available for the C., and it should have at least 2 drinks of milk daily. C.s are subject to numerous ailments; among the more serious are canker of the ear, diarrhoea, inflammation of the bowels, influenza, mange, and worms. Methods of treatment are described in the pubs. of the manufacturers of C. medicines, but in serious cases a veterinary surgeon should always be consulted. House C.s both male and female, are improved if rendered sexless by operation. 'Spaying' (i.e. castration of female C.s) is now a common feature. Female C.s retained for breeding are termed 'queens.'

Shows. The earliest C. show in Britain was at the Crystal Palace, 1871; the first in Scotland soon after in Edinburgh. The National C. Club was instituted under Weir's presidency, 1887. Its ann. exhibition is usually held in autumn. The Scottish C. Club, formed 1894, holds an ann. show in Edinburgh or Glasgow. Besides the National C. Club shows, the shows recognised in England for championship purposes are those held at Newbury and Croydon, the Midland Cos. show held at Worcester, Malvern, or Cheltenham, and the S. Cos. show. The Siamese C. Club (founded 1901) holds a championship show each autumn in London. See E. B. H. Soame, *Cats, long-haired and short*, 1934; E. B. Simmons, *Cats*, 1935; M. Mellen, *A Practical Cat Book*, 1939, and *The Science and Mystery*

of the Cat, 1940; M. H. Clarke, *First Aid to Dogs and Cats*, 1941; M. Joseph, *Cat's Company*, 1946; P. M. Soderberg, *Cat Breeding and General Management*, 1948; L. F. Whitney, *The Complete Book of Cat Care*, 1954; M. F. Schrody, *Cats in Your Home*, 1957.

Cat-bird, popular name of 2 very different species of birds which resemble one another only in that they emit a curious mewling sound. One of these, *Aluroedus crassirostris*, is an Australian bird closely allied to the bower-birds. The other is an Amer. member of the family Turdidae, is related to the mock-bird, and is called technically Galeo-

the earth's past hist. was governed by processes similar to those in action to-day, takes its place.

Catacombs (Gk *kata*, down; *kumbē*, a hollow), excavations forming subterranean galleries for the burial of the dead. The original term, *catacumbae*, was at first applied to a particular burial place only—that of the basilica of St Sebastian—and the word did not refer to the excavations for the tombs, but to the conformation of the ground in the locality. The full title of this burying-place was *caemeterium ad catacumbas* (the burial place in the hollow), often shortened to *catacumbas*. In time the term became



E.N.A.

A NICHE IN THE CATACOMBS AT ROME

scopses carolinensis. The colouring of the two is also different, the former being a bright green, the latter a slate-grey.

Cat Island, see BAHAMAS.

Catabrosa, inconspicuous genus of Gramineae which grows in temperate countries. There is only one Brit. species, the whorl-grass, *C. aquatica*, found in ponds, ditches, and wet sands.

Cataclysmal Action, theory of world hist. in vogue among geologists in the early part of the 19th cent. and thereabouts, to account for the revelations which had been made with regard to fossil remains. It attempted to explain the great differences in the fossiliferous remains in consecutive beds by assuming violent catastrophes which swept over the earth, killing the inhab. and altering its character. The theory is now abandoned, and the uniformitarian theory brought forward by Lyell, which supposes that

applied to all burial places in general, and so, in the 9th cent., to the *crypta* or *caemeterium* of the Christian vaults now known in England as the *C*. There are *C*. in many places, but the most remarkable are those of Rome. These are the *C*. of the Christians, and the earliest belong to the 2nd cent., though by far the greatest number belong to the 3rd and 4th. After the 4th cent. inhumation in *C*. became more and more rare, burial in churches taking its place. But the great respect of the Christians for the dead caused the *C*. to be still held in extreme reverence; people continued to visit them in remembrance of their dead, and to do homage at the tombs of the martyrs. There remain curious notices to visitors, itineraries of pilgrimages, etc., belonging to this time. The faithful took with them precious perfumes, which they poured through the cracks at the top of

the martyr's tomb, and of which they carefully collected again every tiny drop as it passed through the cracks at the bottom, after having touched the body of the saint. With the invasion of Alaric in AD 410, this cult ceased, the C. sharing in the general devastation. Indeed, at this time many of the holy relics were removed and deposited in the various churches for greater safety. There was, therefore, no longer any reason to visit the C.; all trace of them was lost and they were forgotten. Towards the end of the 16th cent. the study of ant. writings brought about by the Renaissance turned people's attention again towards the C., and in 1578 they were accidentally rediscovered by Padre Bosio. This 'Columbus of the subterranean world' devoted 30 years of his life to exploring them, working out their plan, and restoring and studying their monuments. He wrote an account of his work in *Roma Sotterranea*. Ever since the C. have been the object of curiosity to millions, and the work has been continued by Aringhi and Boldetti in the 17th cent., Seroux d'Agincourt about 1825, and the devoted workers of modern times, Padre Marchi, his pupil De Rossi, J. H. Parker, and others. Valuable illustrations have been prepared by Raoul Rochette. The C. consist of an interminable series of long and narrow galleries, 3 to 4 ft wide and 4 to 12 ft high, crossing each other in all directions, forming multitudes of cross-roads, and constituting an inextricable labyrinth. In these galleries hewn in the volcanic rock, the dead are buried in niches or *loculi*, tier above tier, from a short space above the ground to the arched ceiling, in 5, 6, or 7 rows. There is no masonry, the ground supporting itself. Many of the galleries are in 2 or 3 stages, communicating with each other by stairs. The galleries are interspersed here and there by spaces much larger than the ordinary galleries; these are the chambers or *cubicula*. Boissier believes that the tomb of Joseph of Arimathea, with its horizontal niche surmounted by an *arcosolium*, served the early Christians as a model for these tombs. At various distances—sometimes 300 paces—are vertical shafts for light and air. The *loculi* were closed by slabs of marble or huge tiles, and cemented with great exactness. On them was painted or incised a name and a date, with sometimes one or more of the Christian symbols, a dove, an olive-branch, or the sacred monogram. The *cubicula* were decorated with simple fresco-paintings, a curious mixture of pagan and Christian traditions in style and subject. The chambers were family burial places, or contained the tombs of martyrs. The C. are entered from churches above them, and sometimes from simple openings in the ground. The old belief that the C. were secret places of worship of the early Christians is true only to a limited extent. There was no need for secrecy except during the fiercest of the persecutions when Christian worship was penal. There is every evidence, indeed, that at those

times they were used for congregational worship. As places of refuge for any number of people or for any length of time, the C. must always have been impossible, though a hunted refugee may occasionally have found safety there. It appears to be estab. that the C. were entirely the work of the early Christians, and not disused sand quarries, as was once believed. The strata quarried for building purposes were quite unsuitable for the construction of C., which required strata of the hard volcanic rock. Among the more famous of the C. outside Rome are those of Naples, Syracuse, Palermo, Tuscany, Etruria, Malta, and Alexandria. The C. of Paris are improperly so called—they are mere charnel houses. See Hertling and Kirschbaum, *The Roman Catacombs and their Martyrs*, 1956.

Catafalque (Fr. from It. *catafalco*, a word of unknown origin), temporary draped structure, representing a cenotaph (q.v.), used for the lying in state and for the funerals of royalty and notable persons.

Catalan, group of the Romance languages, spoken to-day by over 5,000,000 people in the Sp. provs. of Gerona, Barcelona, Lérida, Tarragona, Alicante, Valencia, and Castellón de la Plana; in the Fr. dept of Pyrénées Orientales; in the Balearic Is.; in the dist. of Alghero, Sardinia; and in parts of the Argentine Rep. There are 2 main dialects: E. (Roussillon, Balearic Is., and Alghero) and W. (Lérida and Valencia). C. dates from the 12th cent., and closely resembles Provençal. During the 12th cent. it came to be regarded as a literary language (*Homelies d'Organyà*), and still enjoys that dignity, the revival of *jocs florals* at Barcelona in 1859 having aroused much popular enthusiasm. The greatest C. poet of the 15th cent. was Ausiàs March (c. 1397-1459) from Valencia, who wrote beautiful *Cants d'amor* and *Cants de mort*. Balaguer and Perdaguer are the chief modern poets. Joan Maragall, Emili Guanyabens, Jeroni Zanné, Josep Lleó-nart, Josep Pijoan, Michael Costa i Llobera, Josep Carner, and Josep Maria López-Picó, among others, are contemporary poets. Among prose writers are Ramon Lull (Raymond Lully), Muntaner, Desclot, Pujols, Alomar, Ruyra, Paradis, Sagarra, Corominas, and many others. See M. Milà y Fontanals, *Estudios de lingua catalana*, 1875; Morel-Fatio, in Gröber's *Grundriss der romanischen Philologie*, 1888; J. Folguera, *Les novel·lors de la poesia catalana*, 1919; A. Griera, *Contribució a una dialectologia catalana*, 1921; W. Meyer-Lübke, *Das Katalanische*, 1925; L. Nicolau d'Oliver, *Resum de literatura catalana*, 1927.

Catalani, Alfredo (1854-93), It. composer, b. Lucca, where he first studied, afterwards going to the Paris and Milan conservatories. Apart from a symphonic poem, *Ero e Leandro*, C. was an almost exclusively operatic composer, and at least one of his operas, *La Wally*, has remained in the It. repertory.

Catalani, Angelica (1780-1849), famous It. singer, the daughter of a tradesman, educ. at the convent of Santa Lucia at

Gubbio. Her glorious voice soon attracted attention, and she made a tour of Europe, receiving enormous fees, soon squandered through extravagance of her husband, Capt. Valabregue. Her first appearance in London was in 1806 and she remained in England, a prima donna without a serious rival, for 7 years. In 1813 she obtained the management of the Théâtre Italien in Paris, together with a large subsidy; but on Napoleon's return in 1815 she left Paris and toured a number of European cities, arousing the wildest enthusiasm. Later she returned to the Théâtre Italien, but followed the same ruinous system there as in London, every expense on orchestra, other singers, and scenery being cut down so that the receipts might go into the hands of her husband. To suit this state of things the operas were arranged in such a way that little of the original save the name survived; while the rest consisted of variations by Rodé, and similar items, with the celebrated *Son regina* introduced instead of the concerted pieces and songs which had been excised. But though she came to financial grief over the Paris opera-house owing to her husband's carelessness, she was unquestionably one of the famous operatic stars of all time with a voice of singular purity and power. She gave up public life in 1828. She was most liberal and generous in her subscriptions to charities, and a woman of fine character.

Catalaunian Fields or Plain, scene of the battle in which Attila, King of the Huns, was defeated by the forces under the Rom. general Aetius in AD 451. The plain was thought to have been situated round Châlons-sur-Marne, in the old prov. of Champagne, France, and the battle is still generally known as the battle of Châlons, but modern authorities place it round Troyes.

Catalca, formerly Chatalla, tn of European Turkey, 25 m. NW. by W. of Istanbul. To the eastward are the Heights of C., upon which are extensive fortifications. C. was the scene of much heavy fighting between the Bulgarian and Turkish forces in the Balkan war (q.v.) of 1912 and 1913. Here, too, in Nov. 1912, occurred the heavy mortality from cholera among the Turkish troops. This outbreak commenced about 7 Nov., and during the height of the epidemic about 1000 fresh cases were reported each day. It was also at C. that the *pourparlers* took place which led up to the truce in the war. The delegates of the Balkan allies and Turkey first met on 25 Nov., and on 3 Dec. all the parties, with the exception of Greece, signed the armistice. During this armistice, which lasted till the end of Jan. 1913, the delegates of the belligerent countries met in London. The C. lines were much strengthened in the First World War.

Catalectic, metrical term applied to a line of verse lacking a syllable in the last foot, e.g. Keats's 'Ever/let the/fancy/room,' which has only the first syllable of the last trochee.

Catalepsy (Gk *katalēpsia*, seizure, or a taking possession of), term applied

to a morbid psychological condition, in which the patient becomes insensible, and there is a sudden suspension of all voluntary motion, the body becoming rigid and fixed, and so remaining until the end of the attack. In some cases there is complete insensibility, so that the person appears to be dead. In other cases the patient appears to be labouring under great mental excitement, and gives utterance to vehement ejaculations, or will even break out into song. The duration of the attack varies; sometimes the patient recovers after a few minutes, sometimes after sev. hours, but in more serious cases the attack will run into weeks or months. In such cases recourse has to be had to tube-feeding to obviate the danger of starvation. It occurs in certain types of schizophrenia as *flexibilitas cerea*, a condition in which the limbs remain fixed in any position they are made to assume and in which there may be general insensibility to pain. C. constitutes in effect, a retreat or abstraction from reality and an attack may be the result of severe emotional conflict, the existence of which may not have been previously recognised. It is a condition that lends itself to fraud and has been deliberately simulated to avoid punishment or responsibility (e.g. military service). See also ECSTASY; HYSTERIA; TRANCE.

Catalogue, in astronomy, the name given to a list of stars, to which various additions are made, depending on the purpose for which the C. is required. Amongst these additions may be mentioned their spherical co-ordinates, that is, right ascension and declination, proper motions, magnitudes, spectra, types, etc. Other kinds of C.s are compiled which deal with binary stars, nebulae, comets, meteor showers, etc.

Catalogues and Classification (Gk *katalogos*, register). A catalogue is a list or enumeration, generally in alphabetical order, of persons or things (sale C., picture C.), especially of the contents of a library or exhibition. Library C. of a kind have existed since the earliest times. They list the books gathered together in one library or, in the case of 'union' C., the contents of a group of libraries; bibliographies are usually lists of books written on any subject, person, or period regardless of their actual location. (See also BIBLIOGRAPHY.) The value of a literary collection may largely depend on good C. to make it of practical assistance. To meet ordinary reasonable demands 2 C.s are essential, one arranged by authors, one by subjects. Some libraries have various other C. such as title C. The catalogue entry has these distinct parts: (1) Author; (2) Title; (3) Imprint (publisher and date); (4) Collation (number of pages, illustrations, etc.); (5) Notes, and other bibliographical details if necessary. Most cataloguers follow the Anglo-Amer. Code of Rules, which should ensure uniformity of method.

Card or sheet C. with typed entries are in most common use to-day, as they are the most convenient method when additions to or withdrawals from the C. are

made. The cards stand on edge in drawers or trays; the sheaf entries are held in loose-leaf binders. There is also a tendency to return to the original printed C., and visible indexes are becoming more widely used. Both these types of C. have the advantage of exhibiting a number of entries at a time, and are mostly in use for the C. of periodicals or gramophone records.

Most libraries now compile their C. either in dictionary or classified form irrespective of whether the catalogue is on cards or in sheaf form. The dictionary catalogue arranges in one alphabetical sequence the author, title, and subject entries, whilst the classified form is arranged according to the classification symbol taken from the classification system in use in the library, with author and subject indexes. With a classified catalogue a logical arrangement of subjects is assured as the catalogue is based on a system which shows what books are grouped together on the shelves, but the reader has to be guided to the arrangement by an alphabetical subject index, whereas the more obviously simple dictionary catalogue is inclined to be misleading because of the multiplicity of words to choose as subject entries, and an elaborate system of cross-references has to be introduced.

The first to make definite scientific rules for compiling book C. was Panizzi (q.v.) in 1839. In that year appeared his 'ninety-one rules' to be observed in making the library catalogue for the Brit. Museum. Every book was to be catalogued from information contained in itself; exact rules as to the entry of the author's name, the title of the book, and the imprint details were laid down. The *General Catalogue of the British Museum* is arranged under authors. The revised Brit. Museum rules were reprinted in 1936. Subject indexes are pub. periodically, in which the subject headings are in alphabetical order.

Classification. The original rigid system of keeping books in certain presses or cases and referring to them by their press numbers has given way in all but the oldest and largest libraries to a system of classification by which books on the same subject are drawn together on the shelves, and related subjects are in close proximity. Numbers marked against the entries in the catalogue lead the reader to the correct part of the classification system, with which the shelves correspond.

The best-known modern book classification system is Dewey's *Decimal Classification*. It was drawn up by Melvil Dewey in 1876 (14th revised ed. 1942, 15th ed., very much shortened, but little used, in 1952, and a 16th ed. in preparation). Dewey divides subjects into 10 numbered groups: 000, general works; 100 philosophy; 200, religion; 300, sociology; 400, languages; 500, pure sciences; 600, applied science; 700, fine arts; 800, literature; 900, travel, hist., and biography. Each group is divided into 10 sections, and these are again subdivided,

and by means of a decimal point further subdivision is made possible. A recent survey showed that 97 per cent of the libraries in the U.K. and the U.S.A. use this system. The Universal Decimal Classification is an adaptation and expansion of Dewey's system. The International Federation for Documentation at Brussels adopted the scheme in 1895 for the arrangement of its enormous card bibliography, and it is responsible for its continuation and revision. Two important libraries using this scheme are the Science Library in London and the Engineering Sciences Library in New York. A *Subject Classification* was evolved in 1894 [by J. D. Brown (the only Eng. scheme produced)] but it is only used by a few public libraries. The *Expansive Classification* of C. A. Cutter (1891), designed to meet at all points the needs of a growing library, has also suffered an eclipse.

The Library of Congress, the national library of the U.S.A., has constructed its own classification system, and although no thought was given by its authors to its adoption by other libraries, many univ. and special libraries are to-day using this scholarly scheme. A recent classification system, now becoming more widely known, is the *Bibliographical Classification* of H. E. Bliss. Based, like the Library of Congress scheme, on the letters of the alphabet, it is capable of a wide interpretation and a short notation, as there are 26 classes into which to divide knowledge, each of which classes is divided 26 times, and then again. Invented by an Amer. who d. in 1955, it is not used in any library in the U.S.A., but is being adopted by many special and univ. libraries in Great Britain and the Commonwealth, notably by the National Library at Canberra, at London Univ., and by the National Book League Library, of which a printed catalogue was pub. in 1955. The Indian *Colon Classification* of S. R. Ranganathan is not yet widely used, but seeks to be comprehensive and to show related subjects by means of a colon. See M. Dewey, *Decimal Classification*, 1876; J. D. Brown, *A Library Classification*, 1912, 1939; H. E. Bliss, *Bibliographic Classification*, 1953; S. R. Ranganathan, *Colon Classification* (4th ed.), 1953; W. C. B. Sayers, *Manual of Classification* (3rd ed.), 1953. See also BIBLIOGRAPHY and INDEXING.

Catalonia (Sp. *Cataluña*; Catalan *Catalunya*), region in NE. Spain containing the provs. of Barcelona, Girona, Lérida, and Tarragona (q.v.). It was formerly a principality which comprised these modern provs. and Roussillon (q.v.). One of the first parts of Spain to be colonised by the Romans, it was overrun by the Visigoths (see GOTHs) in the 5th cent. Later it was part of the march between the Moors (q.v.) in Spain and the Franks (q.v.). An independent co. was formed in Barcelona in the 8th cent. In 1137, by the marriage of Ramon Berenguer IV to the daughter of the King of Aragón, C. and Aragón (q.v.) were united, and in 1479 both were united with Castile (q.v.).

C. was, however, a restless part of the united Sp. kingdom, and was involved in the Carlist (see CARLISTS) and other troubles. In the 19th cent. the sense of Catalan regionalism was stimulated by a revival of the study of the Catalan (q.v.) language and literature. After the Sp. revolution of 1831 (see SPAIN, History) C. prepared an autonomous constitution for itself, and in 1839 the Madrid Gov. recognised C. as an autonomous *generalitat* within the Sp. state. This recognition was suspended, however, in 1834 when the Catalan president and ministers declared C. a federal rep. When the civil war broke out in 1836, C. supported the gov. side, and was again given autonomy. In Dec. 1938 the insurgents succeeded in driving a salient deep into C., and within a few months had taken the greater part of the region. Thousands of refugees from C. crossed the mts into France.

C. is much broken up by spurs of the Pyrenees (q.v.). Its 2 mt ranges, one in the N. and one running parallel with the coast, are separated by a rift valley. It is drained by sev. rvs., including the Ebro (q.v.), Segra, Llobregat, Ter, and Noguera Ribagorçana. The highlands are well forested, the olive is grown in all parts, and vines, cereals, and nuts are grown on the plains. Swine and goats are raised, but there is little other livestock. Woollens, cotton, paper, and cork are included among the extensive manufs., and there are many hydro-electric installations. Area (modern region) 12,333 sq. m.; pop. 3,335,200.

Catalpa, genus of Bignoniaceae, occurs in Asia and more abundantly in N. America. *C. bignonioides* is a native of the E. states of America, where it gains a height of 40 to 50 ft along the banks of rvs. The flowers are large, trumpet-shaped, and white, variegated with yellow and purple; it grows as an ornamental tree in Britain. *C. speciosa* is a valuable timber tree in U.S.A. *C. fargesii* is a Chinese ornamental species.

Cataluña, see CATALUNYA.

Catalunya, see CATALUNYA.

Catalysis, see CATALYST.

Catalyst. Catalysis is a term introduced by Berzelius (1835) to account for the change in the velocity of a chemical reaction produced by substances, called C.s, which do not undergo any permanent change. Investigation and research on catalysis has been vigorously pursued owing to the immense range and use of the principle in industry. Catalytic reactions may be homogeneous when they occur in one phase, e.g. the action of acid in the hydrolysis of cane sugar, or heterogeneous when more than one phase is present, e.g. the action of platinum in the formation of SO₂ from O₂ and SO. Reactions may be catalytically retarded or accelerated, e.g. the decomposition of H₂O₂ is retarded by an acid, the latter being a negative C., whilst the thermal decomposition of KClO₃ by metal oxides is accelerated, the latter being positive C.s. Catalysis may be brought about by one of the reacting substances or by one of the products of the reaction, i.e.

autocatalysis. In some cases C.s favour different reactions so that the action of a C. may be specific. Thus the combination of hydrogen and carbon monoxide can yield methane and carbon dioxide by using a nickel C., whereas with the use of zinc oxide and chromic oxide, methyl alcohol is obtained. This latter reaction is the Fischer-Tropsch process. In the cracking of petroleum (q.v.) it is possible to obtain gases rich in olefinic hydrocarbons, but by using a copper C. high proportions of aromatic hydrocarbons can be obtained. The oxidation of naphthalene to phthalic anhydride is achieved in the vapour phase by the use of vanadium pentoxide, thus providing an example of catalytic oxidation. In most catalytic reactions the C. and chemicals have to be in a high state of purity or the impurities present inhibit the reactions by 'poisoning' the C. Thus the poisoning of the platinum C. by arsenic compounds from the sulphur in the contact process for the manuf. of sulphuric acid led to the use of vanadium pentoxide which is far less susceptible to poisoning. Sometimes catalytic poisoning can be turned to practical advantage, e.g. in the oxidation of ethyl alcohol vapour to acetaldehyde using a copper C., the acetaldehyde tends to decompose into methane and carbon monoxide, but if water is present in the alcohol this latter reaction is inhibited by partial poisoning of the C., thus increasing the yield of acetaldehyde. Acetylene can be made to undergo various reactions under selective catalytic conditions, many of which are of industrial importance. With a mercuric salt in the presence of sulphuric acid, acetylene forms acetaldehyde from which a variety of compounds can be produced, e.g. acetic acid, acetic anhydride, acetone, and ethyl alcohol. Acetylene polymerises under the catalytic influence of spongy copper to give a cork-like substance, cuprene, which serves as a basis for explosives. By using a red-hot tube acetylene polymerises to form benzene. With cuprous chloride and ammonium chloride in acid solution, acetylene condenses to vinyl acetylene and divinyl acetylene. The former is important in the production of Neoprene, an artificial rubber. Acetic acid adds on to acetylene in the presence of mercuric salts as C. to give vinyl acetate, used in the production of vinyl resins for the manuf. of synthetic rubber and plastics.

Catamaran (from a Tamil word derived from *catta*, to tie; *marama*, wood), name given to a vessel or raft used by the Hindus of Madras. It is formed of 3 logs lashed together. The central log is longest, with a curved surface at the fore-end which terminates in a point. It is from 20 to 25 ft long, and is managed by 2 men, who squat upon it and work paddles. The special use of the C. is that it can pierce through the surf on the beach at Madras, and so reach a vessel in the bay when any other kind of boat would founder.

Catamarca: 1. NW. prov. of the Argentine Rep., bounded on the W. by the

Andes and on the E. by the Sierra Aconquija. The country is mountainous, with short streams and many salt lakes. The valleys are fertile, and in addition to producing red pepper, tobacco, and all kinds of grain and fruits support stockraising and dairying. Copper is found in great quantities; many other minerals are mined, including gold, silver, lead, tin, tungsten, iron, and mica. Area 45,829 sq. m.; pop. (largely Indian) 147,200.

2. Cap. of the above prov., on the Rio del Valle, 250 m. NW. of Córdoba, with which it is connected by rail. It has a Franciscan monastery, a national college, and a normal school for women. It is an agric. and dairying centre, with poncho-weaving the chief industry. The chief church, Our Lady of the Valley, is a famous place of pilgrimage. Pop. 30,200.

Catamount, see PUMA.

Catana, see CATANIA.

Catanduanes, or **Katanduanes**, is. of the Philippines, E. of Luzon, from which it is separated by the Maned Channel. Area 553 sq. m.; length 401 m. It is a fertile is., producing coco-nuts, hemp, etc. There is also copper mining. Pop., including is. offshore, 98,216.

Catania: 1. Prov. of Italy, in E. Sicily (q.v.). It has a long coastline on the NE. (the Gulf of C.), and has, in the centre of the prov., the only extensive plain in Sicily, and the most fertile dist. in the is. There are mts in the SW., and in the NE. is Mt Etna (q.v.). The chief riv. is the Simeto. The prin. tns include C., Acireale, Bronte, Adrano, and Caltagirone (q.v.). Area 1,370 sq. m.; pop. 832,000.

2. (ancient Catana) Seaport in Sicily, cap. of the prov. of C., on the Gulf of C., near the S. foot of Mt Etna. It was founded by Gk colonists in 728 bc, became a Rom. colony in the reign of Augustus (q.v.), and was occupied successively by Goths, Vandals, and Saracens (qq.v.). It has been severely damaged by volcanic eruptions and earthquakes on 8 occasions; in the earthquake of 1893 it was almost completely destroyed. During the Second World War it was the scene of heavy fighting during the Allied invasion of Sicily in 1943; C. being a key point in the 'Etna line'—the Ger. defence line from C. to San Stefano (q.v.)—was subjected to bombardment and air attack. There was much damage, but the tn was finally taken by the Eighth Army (q.v.) on 5 Aug. 1943. C. is 18th cent. in appearance, and has an archiepiscopal cathedral (11th–18th cents.) with a baroque façade, a fort (begun 1237) which is now a museum, and a univ. (1434). The monastery of S. Nicolò has the largest church (17th–18th cents.) in Sicily. The immediate environs of the city are desolate, but there is a large trade in agric. produce, wine, cotton, vegetables, and fruit from the plain beyond. There are textile, engineering, sulphur, and food-stuff industries, and manufs. of articles of lava and amber. Pop. 292,600. See ITALIAN FRONT, SECOND WORLD WAR, CAMPAIGNS ON.

Catanzaro: 1. Prov. of Italy, in central

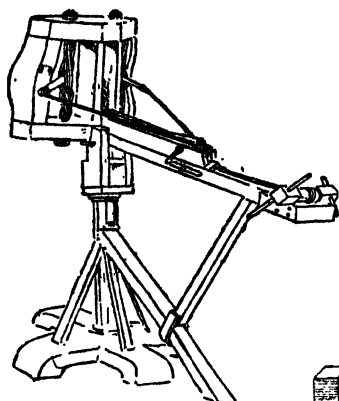
Calabria (q.v.). It is the central part of the 'toe' of Italy, and is bordered on the W. by the Ionian Sea (q.v.) and on the E. by the Tyrrhenian Sea. The prov. is mainly mountainous with high ranges of the S. Apennines (q.v.), much broken up by riv. valleys. Livestock is raised, and wines, olives, and fruit are produced. The prin. tns include C., Nicastro, and Crotona (qq.v.). Area 2060 sq. m.; pop. 746,000.

2. It. tn, cap. of the prov. of C., standing on a hill, 75 m. NE. of Reggio di Calabria (q.v.). It was damaged in the Second World War. There is an archiepiscopal cathedral, and an interesting museum. Silk and velvet are manuf., and there is a trade in olives and wine. Pop. (com.) 54,400.

Cataporesis, synonymous with **Electrophoresis** (q.v.), but the latter term is generally preferred.

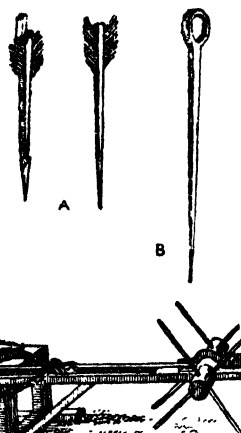
Catapult (Gk *kata*, down; *pellein*, to hurl), anct military engine for throwing stones, arrows, and darts. Some say that it was invented by the Syrians in 200 bc, others that Dionysius, the tyrant of Syracuse, invented it in 399 bc. It was used by the Greeks in the time of Philip, King of Macedonia, by the Carthaginians, and by the Romans. It disappeared at the beginning of the Middle Ages. The C. had a bow of wood or steel, which was bent by means of a windlass, the cord being finally released by a spring. See also BALLISTA, and fig. on p. 170. See Sir R. Payne-Gallwey, *Projectile Throwing Engines of the Ancients*, 1907.

Cataract, disease of the eye caused by the clouding of the liquid contents of the crystalline lens. This is situated with its anterior surface 3.6 mm. behind the anterior surface of the cornea and is the prin. image-forming part of the visual apparatus, the alteration of the curvature of its anterior surface giving accommodation, i.e. focusing for objects at varying distances. The cloudiness which is caused by lack of nutrition occurs at all ages, but more often in the cases of old people and young children. It is sometimes present at birth, exists in connection with some general diseases such as diabetes, in senile decay, or when the eye is subject to local injury caused by a blow. Irradiation C. may occur in those exposed to intense heat rays from a furnace or similar source, and in those exposed to X-ray and radium radiations. Heredity plays little or no part in its formation. It is painless and unaccompanied by inflammation. One eye is often affected alone, and blindness is caused for all general purposes, but the patient is able to distinguish light from darkness. The lens itself is not homogeneous, but consists of numerous concentric layers increasing in density from the outer to the central portion, the whole being encased in a transparent capsule. The formation of the C. is gradual, either starting from the centre or from the edges, and when it has covered the whole of the lens, the latter is filled with a homogeneous pearly white or amber-coloured opacity. In its early stages it is seen by the ophthalmoscope



FORMS OF
CATAPULT

A, darts; B, winch for bending the catapult.



Hulton Picture Library

invented by Helmholtz for examining the interior of the eye. C. may be either hard or soft; the latter, however, is the general condition for cases occurring in young people. Treatment must consist of an operation. As a palliative, however, a mydriatic such as atropine increases the opening of the pupil and so allows more light to reach the retina; but it is no cure, and has no power to arrest the progress of the malady. The operation can be performed by means of a puncture of the lens by a fine needle passed through the cornea at the margin and stirring the lens contents, when the substance of the lens passes into the aqueous humour of the eye and dissolves. This form of operation is generally performed on soft C. When the lens is hard it is extracted entire. With a narrow knife an incision is made in the upper part of the cornea at its junction with the sclerotic, the lens, with or without its capsule, is taken out, the cut edges put together, and the eye bandaged. In either case strong convex glasses must be worn after the operation to replace the missing lens. Some cases of operation for C. are unsuccessful, because the retina also is diseased. See BLINDNESS.

Catarmán, tn on the N. coast of Samar, Philippines, on the Philippine Sea. Corn and rice are grown. Pop. 33,153.

Catarrh, see COLD.

Catarrhini, name given to a group of monkeys which comprises the families

Cercopithecidae (baboons, macaques, etc.), Colobidae (langurs and guerozas) and Simiidae (anthropoid apes). They differ from the Platyrrhini, which comprises the remaining 2 families, the Hapalidae and Cebidae, chiefly in having their nostrils close together and looking downward as opposed to those looking outward and separated by a broad cartilaginous septum. The C., moreover, have often ischial callosities or patches of brightly coloured skin on the buttocks, cheek pouches, 32 teeth, and their tails when present are never prehensile. The other species have 36 teeth, no ischial callosities or cheek pouches, and their tails are frequently prehensile. The former are denizens of the Old, the latter of the New World.

Catauxi, warlike, cannibal tribe, living in W. Brazil. They go naked, and wear bangles and anklets. The men are very handsome, with fair complexions, and are extremely strong. They mould and ornament pottery and cultivate manioc extensively.

Catawba, pink grape, probably an accidental hybrid of the native and European vines grown on the Catawba R. in N. Carolina. It is the Amor. grape best known in Europe owing to Longfellow's unfortunate poem which extolled a sparkling wine made from it as 'more divine, more delicious and dreamy' than champagne.

Catbalogan, tn of the Philippines, cap. of the prov. of Samar. Coco-nuts, rice,

and hemp are grown, and copra and hemp exported. Pop. 26,839.

Catch, musical form, a round in which each singer in turn catches up, as it were, the words from his predecessor and which is so contrived that this catching at each other's words distorts the sense, giving it a humorous or an absurd turn.

Catchfly, name applied to many species of the caryophyllaceous genera *Silene* and *Viscaria* which are very common in N. lands. They obtain their name from their ability to catch insects by means of a glutinous substance which is exuded from the calyx and glandular hairs on the stalks. In both genera the calyx is gamosepalous and the stamens are 10 in number, but in the genus *Silene* there may be only 3 styles, while *Viscaria* has 5 styles and 5 carpels. *S. conica*, Striated C., *S. dichotoma*, Forked C., *S. anglica*, Small-flowered C., *S. armeria*, Sweet William C., are anns.; *S. otites*, Sp. C., *S. italica*, Italian C., and *S. nutans*, Nottingham C., are all found in Britain. *V. alpina*, Red Alpine C., and *V. vulgaris*, Red Ger. C., are rare tufted perennials of rocks.

Catching Bargain (also **Snatching Bargain**) means a purchase made from an expectant heir of his reversionary interest in real or personal property for an inadequate consideration. The law was formerly very stringent in setting aside such bargains, but mere undervalue will not now operate to nullify a bargain 'if made in good faith and without fraud or unfairness.'

Catchment Area, area in which water from rainfall, springs, etc., collects to form the supply of a riv., stream, or drainage area. The boundaries of a C. A. are the heights or ridges of land which divide it from other drainage areas. A certain proportion of the rainfall is always lost by evaporation and absorption. The 'run-off' is that water which actually reaches the stream or riv. Also called a catchment basin.

Catchpoll (Low Lat. *chassipullus*, lit. 'chase-chicken'), obsolete term of reproach used to denote the assistant of a bailiff whose duty it was to make arrests. It was also used to mean a tax-gatherer.

Cateau, Le, or Le Cateau-Cambrésis, Fr. tn in the dept of Nord, on the Selle. It was held by the English for a time in the 15th cent. but later surrendered to Dunois (q.v.). A treaty between Henry II of France and Philip II of Spain was signed here in 1559. There are breweries and metal-works, and soap and textiles are manuf. Pop. 7700.

Cateau, Le, Battle of, name given to the action fought on the W. front in the First World War on 26 Aug. 1914, during the retreat of the Brit. forces before the Ger. invasion of Belgium and France. The Brit. forces comprised the 3rd, 4th, and 5th Divs., or 2nd Army Corps, under Maj.-Gen. Sir Horace Smith-Dorrien. The battle resolved itself into a desperate resistance by one half or the Brit. Army temporarily cut off from the other half, against a Ger. attack by no fewer than 7 Ger. divs., backed by a superior force of

artillery. Sir John French, the Brit. Commander-in-Chief, abandoned his plan of holding a position behind the Le C. road, preferring to withdraw further, towards the Roisel-St Quentin railway. He therefore ordered the 2 corps commanders, Sir Douglas Haig and Sir Horace Smith-Dorrien, to conform to this change of plan. Haig accepted, but Smith-Dorrien's situation was too precarious to permit him to do anything else but face the Germans. No support from the 1st Corps being possible, his 3 divs. had to make the best of a situation which, on paper, seemed to point to annihilation. The precise location of the battle was near Troisvilles, thence N. of Audencourt, Hautcourt, and N. of the Cambrai-St Quentin railway. The battle was mainly an artillery duel, in which the Brit. guns were outnumbered by 5 to 1. After 6 hours' continuous bombardment, many of the Brit. batteries were out of action, and a couple of hours later the right flank of the 5th Div., under Sir Charles Ferguson, was turned, and the enemy were pouring through the gap between the 2 army corps. Smith-Dorrien then ordered a general retirement. Two battalions however, the 2nd Batt. King's Own Scottish Borderers and the 2nd Batt. King's Own Yorkshire Light Infantry, either misinterpreted or ignored the order to retire and, continuing their dour resistance, were all but annihilated. Terrible losses were also sustained by the 1st Batt. Gordon Highlanders and the 2nd Batt. Royal Scots, who found their retreat by road cut off by the blazing vil. of Audencourt, so that they were forced to take to the open country and carry out a series of desperate rearguard fights. The extrication of the Brit. corps reflected the highest credit on the skill of Smith-Dorrien.

Catechism (Low Lat. *catechismus*, from *catechizare*, to catechise; from Gk *katechein* to catechise, instruct; all from a root word meaning echo): 1. Religious instruction given by means of questions and answers. See also SUNDAY SCHOOL.

2. A book of elementary instruction containing, by means of questions and answers, an exposition of religious dogma.

3. Elementary instruction, oral or written, in any branch of knowledge. In the primitive Church it was the instruction given to pagans, Jews, and others in preparation for baptism. The pupil was called the catechumen, and the instructor the catechist. The catechumens occupied a special place in the church, either under the portico or in the anterior gallery. They were not allowed to remain after the gospel at the mass, the eucharistic sacrifice itself being a mystery into which they were initiated only after baptism. The first part of the mass therefore became known as the mass of the catechumens. During the first cents. after the apostolic age the catechumenate of pagans was long, taking at first 3 years, then 2; but with the conversion of the empire, adult conversions became rare, and infant baptism (always usual for the children of Christian parents)

became the norm, the instruction being given afterwards and (in the west) followed by confirmation which was detached from baptism and first communion with which it had hitherto formed one rite of Christian initiation. The primitive C. has only survived in a few fragments that scholars claim to detect in the N.T. epistles, notably in 1 Cor. xi. 23 ff. and xv. 3 ff. The earliest Christian C.s are those of Kero, a monk of St Gall in the 8th cent., and of Otfried, a monk of Weissenburg in the 9th. From the time of the Reformation little books of doctrinal questions and answers called C.s spread and multiplied, springing from the emulation between Catholics and Protestants. The Catholic Church pub. in 1566 the *Summa Doctrinarum* of Peter Canisius, in opposition to the Protestant C.s of Luther. A little later came the C. of the Council of Trent, laying down a uniform plan of instruction, and priests were enjoined to teach it at least on Sundays and feast days; they were instructed to make the teaching as attractive as possible, by the use of gentle and maternal language, the offering of little rewards, and so on. Later came the C.s of Bellarmine, 1603, Bossuet, 1687, and the *Schema de Parvo*, 1870; among the Protestants, the *Geneva Catechism* of Calvin, 1536, the *Catechism of Heidelberg*, 1563, the *Zürich Catechism*; and in 1549 the C. which, with additions by Bishop Overall in James I's reign, forms the Anglican C. of the present day. The Scottish Presbyterians have Craig's C., 1592, and that of the Westminster Assembly of Divines, 1648 now in use. Jewish C.s also exist which include *The Thirteen Articles of Belief* (12th cent.) of Maimonides, Rabbi Levi's *Book of Education*, and those of Leser and Piscotto in use at the present day.

Catechol, see PYROCATECHIN.

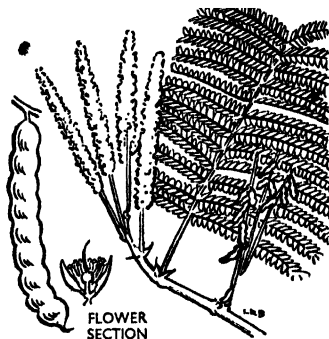
Catechu, or Cutch (*cate*, tree, *chu*, juice; Malay *káchu*), extract obtained from sev. plants, especially from the wood of *Acacia catechu* and *Acacia suma*, natives of India. This kind is known as 'black C.', and is used in tanning and dyeing. The best quality, called 'Pegu C.', is obtained in blocks covered by large leaves. The 'pale C. of pharmacy,' or 'gambir' (*terra japonica*) of commerce, is a similar extract produced from the leaves of *Uncaria gambir* and *U. acida*, plants of the E. Indian Archipelago. It is sold in dry cubes about 1 in. square, and is used medicinally as an astringent, and also largely in tanning and dyeing, yielding a variety of drabs, browns, and olives. It is often used for colouring stout canvas. Its main ingredients are catechuic acid or catechin, and a peculiar variety of tannic acid. 'Areca C.' is obtained from the fruits of the areca or betel palm.

Catechumen, see CATECHISM.

Categorical, term in logic. Aristotle used it in its merely literal signification of that which is affirmative as opposed to negative. In later logic it denoted a proposition which is asserted absolutely in contradistinction to one that is hypothetical or involves a condition. It still

has this connotation, but the distinction between C. and hypothetical judgments is considered in modern logic to be one of substance or content, and not one that is merely dependent on the grammatical form of the words used. See A. Wolff, *Essentials of Logic*, 1926; B. Bosanquet, *Logic*, 1931; W. V. Quine, *A System of Logic*, 1934.

Categorical imperative, name by which Kant in his system of ethics designates the fundamental principles of all moral laws. He held that the will or reason was guided in any given direction by an *a priori* cognition of what we ought and what we ought not to do in a particular set of circumstances; and that we were free to obey or disobey, morality being neither empirical nor a question of self-interest. This unconditional rule of duty which is valid because innate, Kant calls the C. I., and contrasts it with a command, the validity of which is dependent on some presupposed end, e.g. self-interest. Schopenhauer attacked the theorem of the C. I. by saying that Kant confused reason with virtue and that in reality he made all actions depend upon self-interest.



CATECHU

Category (Gk *kategoria*, predication), term in logic and philosophy applied to certain general classes under which objects of knowledge can be arranged. The name was first used by Aristotle for the classification of all kinds of predicates. His C.s are 10 in number: substance, quantity, quality, relation, place, time, situation, possession, action, and suffering. This arrangement was disputed by the Stoic philosophers, and various alterations and reconstructions have been made since. The term was applied by Kant to the conceptions which the mind forms to raise the matter of knowledge received from the senses into an intelligible notion. His C.s are (1) quantity, including unity, plurality, totality; (2) quality, including reality, negation, limitation; (3) reality, including substance, causality, reciprocity; (4) modality, including possibility,

existence, necessity. These C.s only deal with the *a priori* conceptions of the understanding, and later philosophers have extended the use of the term to cover any necessary conception under which reality may be thought, and have given them an objective instead of only a subjective significance. Hegel completed this work, which was begun by Fichte, and he divides all C.s into 3 main classes—being, essence, and concrete thought—each subject to much subdivision. J. S. Mill classifies all describable things as (1) feelings or states of consciousness; (2) the minds which experience these feelings; (3) the external objects supposed to excite sensations; (4) the successions and co-existences, likenesses and unlikenesses between feelings or states of consciousness.

Catel, Charles-Simon (1773-1830), Fr. composer, b. Aigle, Orne, studied at the school in Paris that was to become the Conservatoire, on the foundation of which in 1795 he became prof. of harmony. In 1802 he pub. a treatise on the subject and in 1810 he became Inspector of the Conservatoire. The same year he produced the most successful of his 10 operas, *Les Bayadères*. He also composed military music, symphonies for wind instruments, choral works, chamber music, etc.

Catelectrotonus, see ANELECTROTONUS. Catena (properly Vincenzo di Biagio) (c. 1470-1531), It. painter, a disciple of Giovanni Bellini. His works include 'Madonna between St Francis and St Jerome' (Venice), 'Count Raymond Fugger' (Berlin), but the fine 'Warrior adoring the Infant Christ' (National Gallery) once ascribed to him has been thought beyond his abilities and worthy of Giorgione. There are many examples of his work at Venice.

Catenary (Lat. *catena*, a chain), name given to the curve assumed by a perfectly flexible inextensible string suspended at each end and hanging under the action of gravity. (This definition will be extended later.) The figure shows the form of the curve, *A* and *B* being the points of suspension, which need not be in the same horizontal line but are shown to be in the figure. The lowest point *V* of the *C.* is known as the vertex and the line *PT* is the tangent at a point *P* on the curve; the horizontal line through *V* and the perpendicular to it, *Vy*, can be taken as axes of coordinates, but another line is usually taken as axis of *x* and is determined as follows.

Along the tangent at the point *P* measure off *PT* equal to the arc *PV*, then draw *TD* perpendicular to *PT* meeting the line *PD* drawn perpendicular to the *x*-axis at *D*. The line *TD* is constant in length, wherever *P* is taken, and if through *D* a line is drawn parallel to the *x*-axis, meeting the extension of the *y*-axis in *O*, *TD* is always equal to *OV*. Each of these is denoted by *c*, and if the tangent *PT* makes an angle θ with *Ox*, the new axis of *x*, it can be shown that $s = c \tan \theta$, or since $\tan \theta = dy/dx$, this is easily reduced to the form $s = c \sinh \frac{x}{c}$.

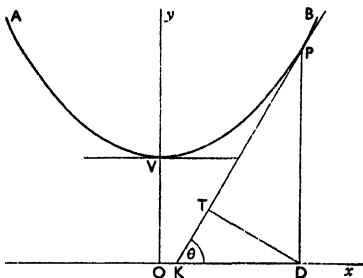
Also, it can be shown that $y = c \cosh \frac{x}{c}$.

These hyperbolic functions (q.v.) can be expressed in the forms

$$s = \frac{1}{2}(e^{x/c} - e^{-x/c}),$$

$$y = \frac{1}{2}c(e^{x/c} + e^{-x/c}).$$

The axis of *x* is known as the directrix of the *C.* Some of the properties of the *C.* are as follows: Since at any point *P* on the *C.* the length *DT* is equal to *c*, it follows that the length of the perpendicular on the tangent drawn from the foot of the ordinate is constant. The tension at any point *P* of the *C.* is the same as the weight of a portion of the string whose length is equal to the ordinate *PD*. The length of the radius of curvature at any point *P* is equal to the length of the normal between that point and the directrix. From this it follows that the length of the radius of curvature at *V* is equal to *VO* or *c*. The involute of the *C.* starting from its lowest point is the tractrix (q.v.). A *C.* is developed by the focus of a parabola which rolls along a right line without sliding.

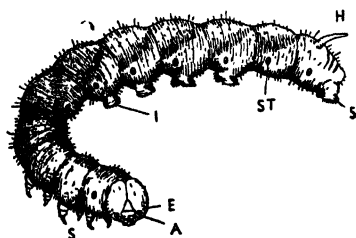


Cateran (Gaelic and Irish *ceatharnach*, a soldier), originally an Irish or a highland irregular soldier, a kern; now usually meaning a highland freebooter or reaver.

Caterham and Warlingham, urb. dist. of Surrey, England, 6 m. SW. of Croydon and 18 m. S. of London. The dist. is spread out over sev. hillsides ranging in altitude from 300 to over 800 ft above sea level, with many ac. of natural open space. It adjoins the N. Downs. The Brigade of Guards depot is here. Pop. 32,000.

Caterpillar, name given to the larvae of the Lepidoptera, or butterflies and moths. It is a worm-like animal which consists of a head and 13 segments, the first 3 being thoracic and the last 10 abdominal. On the first 3 segments there are 6 true legs, each of which is jointed; and the abdominal segments often bear a varying number of tubular *pro-legs*, each ending in a circlet of small hooks, the last 2 being claspers. These larvae are curiously dissimilar from the perfect insect in that they possess large mandibles, while their maxillae and labial palps are

small. The spinneret, or the organ by which the silk is exuded, opens on the middle of the labium, and sometimes projects as a spine. The sense of sight is very rudimentary for, though half a dozen pairs of simple eyes (ocelli) are present on the sides of the head, they are probably merely sensitive to the difference between darkness and light. The other senses also are but feebly developed, since this larval stage is essentially a feeding period in the life-hist. of the insect, and every effort is made in the direction of storing up food ready for the resting stage. As might be expected in this voracious creature, the stomach is extremely large,



CATERPILLAR

A, small antennae; E, simple eyes; H, 'horn'; ST, stigmata; S, segments; 1, first pro-leg; 5, fifth pro-leg.

and it is also very simple in structure. The skin often contains odoriferous and other glands; it is very thin, and a slight wound will cause it to break and exude so much blood that the larva soon dies. The sexual organs are rudimentary and cannot be seen externally, but that they do exist has been fully proved, and in a few cases the sexes are said to differ in colour. The C. is frequently a brightly coloured creature, more especially when its unpleasing taste gives it no cause to fear birds or other enemies, but at other times it is colourless, or takes on the hue of the plant on which it lives. It may be smooth or covered with hairs. Mimicry prevails very greatly among the various species, and the appearance of some, which resemble twigs, is most remarkable in its perfection. A serious enemy to the larvae is the Ichneumon fly, which has the unfeeling habit of depositing its eggs in the soft bodies of the feeding lepidoptera; as the eggs hatch the resulting larvae use up the reserve material in the bodies of their host, so that when the resting-stage comes the creature has no stored up food and consequently dies. A C. should be distinguished from a grub, which is a legless larva.

Catesby, Mark (c. 1679-1749), naturalist, b. London. From 1710 to 1719 he travelled in N. America and gathered together a remarkable collection of plants. From 1722 to 1726 he visited Carolina, and on his return he pub. *Natural History*

of Carolina, Florida, and the Bahama Islands, *Florus Britanno-Americanus*, and a work on the fishes, reptiles, and insects of the is. of Providence (1731-1743).

Catesby, Robert (1573-1605), conspirator, b. Lapworth, Warwick, son of a wealthy Rom. Catholic squire, and possibly educ. at Douai and Gloucester Hall, Oxford. He was heavily fined for his part in Essex's rising in 1601 and was imprisoned in 1603. A fanatical Catholic, C. was the author of the Gunpowder Plot of 5 Nov. 1605. On its discovery he fled to Holbeach in Staffs, where he was shot while resisting arrest.

Catfish, name given to any member of the sub-order Siluroideae, the species of which are characterised by having a naked skin without true scales, a small maxillary bone, and the presence of barbels about the mouth. They inhabit temperate and tropical freshwaters and some live in the sea. Over 1000 species are known to exist, and these vary greatly in nature and habit; among them may be mentioned *Malapterurus electricus*, the C. of the Nile which gives an electric shock, *Silurus glanis*, the wels of Ger. rivs. which weighs 300 to 400 lb., *Ictalurus ponderosus*, the white channel-cat of the Mississippi, which is one of the largest fresh-water fishes, and the genera *Callichthys*, *Doras*, *Oxydoras*, and *Rhinodoras*, which travel overland in dry seasons for new ponds. *Amblyurus nebulosus*, the common C. of N. America, has now been introduced to sev. places on the European continent. Species of the S. Amer. *Corydoras* are often to be seen in tropical aquaria. The term C. is also applied to the genus *Anarrhichas*, marine in habitat and not closely related to the above. *A. lupus* is common on the Brit. coasts; in spite of its forbidding appearance, it provides excellent food.

Catgut, name given to the cord made from the intestines of the sheep, ox, horse, mule, and ass—never from those of the cat. It is supposed that the proper word was *kitgut*, *kit* meaning a small fiddle, and that it has become confused with the word *kit* used for cat. C. is made into strings for harps, violins, and other musical instruments, for bow-strings, whipcord, for hanging weights of clocks, suturing wounds, and for belts for driving lathes. The intestines are thoroughly cleansed, scraped, rendered aseptic, and drawn through a perforated brass thimble. The advantage of C. as a suturing material in surgery is that it is slowly absorbed by the tissues, thus obviating the need to remove it after use.

Cathari, Cathars, or Catharists (Gk, 'the pure'), gnostic heretics who menaced the Church and society in the Middle Ages. They seem to have come from Armenia to Bulgaria, where they were called Bogomils or Paulicians, and eventually spread to W. Europe. In the S. of France they were known as Albigenses (q.v.). The heresy first appeared in the 10th and lasted until the middle of the 14th cent., when it was finally extinguished by the Inquisition. Its doctrines were closely akin to those of Manichaeism (q.v.), from

which they were perhaps derived. The C. were divided into 2 classes: the 'Perfecti' or inner and strict adepts, and the 'Credentes' or Believers. The latter only had to promise to become 'Perfecti' before their death, i.e. to receive the initiatory rite called the *consolamentum* conferred by laying on of hands. Infant baptism was rejected. The 'Perfecti' had to renounce sexual intercourse and marriage as evil and the source of evil. The *Endura*, or ritual suicide, was in certain circumstances recommended. See Daniel-Rops, *Cathedral and Crusade*, 1957.

Catharine's (St) College or Hall, Cambridge, founded by Dr Robert Woodlark, who had been chancellor of the univ. in 1459 and 1462. It was opened on St C.'s day, 1473. The rebuilding, begun in 1634, and completed during the 17th and 18th cents. was largely encouraged by Dr Eachard, Master 1675-97. Robert Grumbold was stonemason throughout the major part of this work, and Wm Talman was consulted about the Chapel, completed 1704.

Catharometer, instrument used for ascertaining the rate of flow, or any change in the composition of a gas at a given point. An electrically heated wire is put into the gas and the changes in its resistance consequent on cooling are indicated. The instrument can also be used for measurements on liquids.

Cathartic, medicine used to produce evacuation of the bowels. The term is often used to describe a purgative moderate in its action, more forcible than a laxative, but more gentle than a drastic purgative. The action usually is to cause an increased flow of secretion from the lining of the alimentary canal and so aid in the removal of irritating matter.

Cathay, name by which China was commonly known in Europe during the Middle Ages, introduced by Marco Polo and derived from Khitai or Khitan, the earliest Mongolian tribe known to have conquered N. China. It disappeared early in the 12th cent. The Russians still call China 'Khitai'.

Cathcart, Charles Murray, 2nd Earl (1783-1859), soldier, son of Sir Wm Schaw C. He joined the Life Guards in 1800 and served as lieutenant-colonel at Salamanca and Vittoria. Took part in battle of Waterloo (1815), and received the C.B. Of a scientific disposition, he discovered the mineral greenockite. Succeeded to the earldom in 1843. Sent to Canada in 1846 as commander-in-chief; general, 1854.

Cathcart, Sir George (1794-1854), third son of the 1st Earl C., likewise a brilliant soldier, who took part in the European campaigns. He was aide-de-camp to the Duke of Wellington, and served at Quatre Bras and Waterloo. He was present with his father at the Congress of Vienna (1814). Appointed commander of King's Dragoon Guards in 1838. In 1852 he was made governor of the Cape and brought the Kaffir war to a speedy termination. K.C.B., 1853. Commanded the 4th Div. in the Crimea and was killed

at Inkerman. Wrote *Commentaries on the War in Russia and Germany*, 1850.

Cathcart, Sir William Schaw, 1st Earl (1755-1843), soldier and diplomatist, son of Charles, 9th Baron C. He first studied the law, then entered the army, and took part in the Amer. campaign. Major-general, 1794; lieutenant-general, 1801; commander-in-chief in Ireland, 1803-5. Took part in attack on Copenhagen, 1807. Created earl, 1814. Ambassador at St Petersburg, 1814-21.

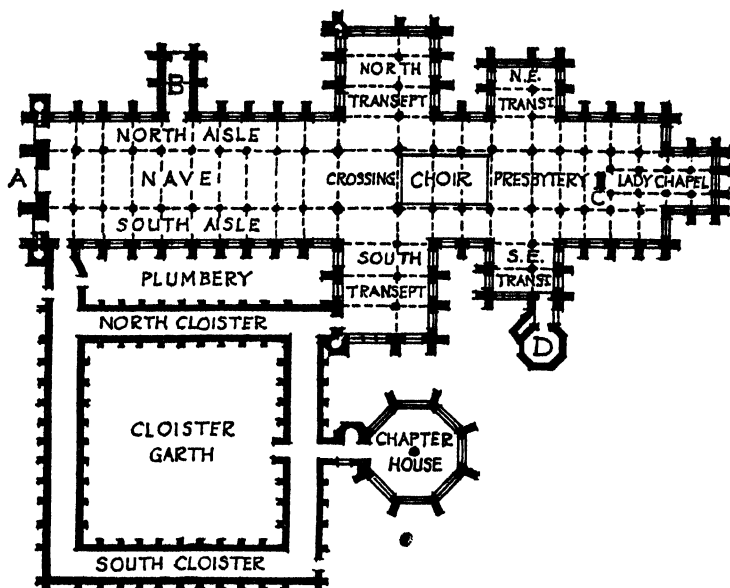
Cathcart, dist. and tn in S. Africa, in the SE. of Cape Prov., 109 m. NW. of E. London by rail. Good sheep and cattle country. Pop. (tn) Whites, 902; Bantu, 2134; Coloureds, 277.

Cathedral (Lat. *cathedra*, a seat or throne), prin. church of a diocese where the bishop's or archbishop's throne was placed. In early basilican churches, this was in the apse, behind the altar, so that the bishop faced the congregation; later the usual position came to be on the S. side of the choir. The term C. has no reference to the mere size of the church: some Eng. par. churches are larger than the smallest C.s.

Of 45 Anglican C.s in England, only 18 are medieval foundations. They were either *secular*, i.e. served by canons (Chichester, Exeter, Hereford, Lichfield, Lincoln, London, Salisbury, Wells, York), or *monastic*, i.e. served by monks (Bath, Canterbury, Carlisle, Coventry, Durham, Ely, Norwich, Winchester, Worcester). After the dissolution of the monasteries, 1536-9, new C.s were estab. in formerly monastic churches (Bristol, Chester, Gloucester, Oxford, Peterborough). During the 19th and 20th cents. new C.s have been estab. in formerly monastic churches (St Albans, Southwark); formerly collegiate churches (Manchester, Ripon, Southwell); and numerous former par. churches, mostly enlarged or rebuilt. Guildford C. is, however, a new foundation. Liverpool C. (q.v.), begun in 1904, will be the largest eccles. building in England when completed; a Rom. Catholic C. is also in course of construction there. Coventry C., which was destroyed during an air-raid in 1940, is being rebuilt. The administration of a C. is carried out by a chapter, i.e. an assembly of canons. Reference is made to many C. buildings under ARCHITECTURE (See figure p. 176).

Cathelineau, Jacques (1759-93), poor linen merchant who led the Vendéans in their opposition to the Fr. Revolution; called by peasants the Saint of Anjou, on account of his great piety. He took a leading part in the storming of Cholet, and after the seizure of Saumur was made general of the rebel forces. In 1793 he was mortally wounded when attempting to capture Nantes.

Cather, Willa Sibert (1876-1947), Amer. authoress, b. Winchester, Virginia. When about 8 years old she was taken to a Nebraska ranch. She graduated from Nebraska Univ. in 1895, and became Eng. mistress in Alleghany High School. Entering journalism, she became associate editor, and eventually managing editor, of *McClure's Magazine*, 1906-12. Her best



PLAN OF A TYPICAL ENGLISH CATHEDRAL: SALISBURY
A, West Door; B, North Porch; C, High Altar; D, Sacristy.

novels are of the pioneering life in the W., and as she acknowledged herself a follower of Henry James, her work is notable for its form and style, which owe something, too, to Turgenev and Flaubert. *Death Comes for the Archbishop*, 1927, which depicts with sympathy and insight the facts of a priest's life in New Mexico a cent. ago, is probably her finest novel. *Shadows on the Rock*, 1931, is a very good story of 18th-cent. Quebec. She also pub. a number of short stories, and in 1936 a vol. of essays entitled *Not under Fortu*. Other works: *April Twilights* (verse), 1903; *The Troll Garden*, 1905; *Alexander's Bridge*, 1912; *O Pioneers*, 1913; *The Song of the Lark*, 1915; *The Bohemian Girl*, 1917; *My Antonia*, 1918; *Youth and the Bright Medusa*, 1920; *One of Ours*, Pulitzer prize novel, 1922; *A Lost Lady*, 1923; *The Professor's House*, 1925; *My Mortal Enemy*, 1926; *Lucy Gayheart*, 1935; *Sapphira and the Slave Girl*, 1940.

Catherine, St: 1. Virgin martyred at Alexandria in 310. Before her execution she is said to have disputed successfully with a group of pagan philosophers. In art she is generally depicted with the instrument of her death, a spiked wheel. The Orthodox monastery on Mt Sinai claims to possess her body which was translated thither by angels in the 10th cent. Her feast is on 25 Nov.

2. *St Catherine dei Ricci* (1522-89), b.

Florence, of noble parentage. Entered the convent of Dominicans at Prato, where she d. Canonised in 1746; her feast is on 13 Feb.

3. *St Catherine of Bologna* (1413-63), joined a community of Augustinian nuns who afterwards became Poor Clares. Later she was appointed abbess of the Poor Clares at Bologna. Celebrated for her visions, in which she beheld the details of our Lord's Passion, she was canonised in 1712. Her feast is on 9 Mar.

4. *St Catherine of Genoa* (1477-1510), a member of the Fieschi family. After an unhappy marriage she devoted her life to nursing the sick and poor. She was canonised in 1737; her feast is on 15 Sept. See F. von Hügel, *The Mystical Element of Religion*, 1908.

5. *St Catherine of Siena* (1347-80), twenty-fifth child of a dyer. Subject to ecstatic visions from her earliest childhood, she belonged to the order of St Dominic, and her confessor, Father Raimondo of Capua, wrote a detailed account of her life and visions. She worked among the poor and for the conversion of sinners, assisted by a band of devoted followers. Although an illiterate girl, she exercised great religious and political influence; for she was instrumental in bringing Pope Gregory IX back to Rome from Avignon, and she succeeded in reconciling Florence to the

Holy See. During her short life she was at times subject to the most terrible temptations, but Christ appeared to her and comforted her. Over 400 of her letters have survived, together with her famous *Dialogue*. Canonised in 1461, and declared the patron saint of Italy in 1939, her feast is on 30 April.

6. *St Catherine of Sweden* (1331-81), daughter of Prince of Nierok and St Bridget. Placed in a nunnery of Risborg when 7. After marriage with Eggard Lydersson, with whom she lived in continency, she became, as a widow, abbess of Vatzen. Her feast is on 24 Mar.

Catherine I (1684-1727), Empress of Russia, second wife of Peter the Great, was of obscure birth. She was taken prisoner by the Russians during the Northern war, but in 1711 married the tsar. After his death in 1725 she succeeded him on the throne and ruled through her favourite, Menshikov. Energy, good sense, and a lively interest in science and art characterised her rule. The Academy of Sciences was officially founded by her.



CATHERINE II OF RUSSIA

Engraving of a print by Caroline Watson, after a picture by Rosselin.

Catherine II, often called the Great (1729-96), Russian empress, b. Princess of Anhalt-Zerbst, daughter of a Prussian field marshal. In 1745 she married the future Emperor Peter III; she succeeded to the throne in 1762 after the overthrow and murder of her husband by her supporters in the Guards. She had a succession of lovers, many of them prominent soldiers or administrators such as Potëmkin (q.v.). C. was herself extremely intelligent, though totally immoral and unscrupulous, and throughout her reign corresponded with Voltaire and other Encyclopaedists; an indefatigable worker, she was an outstanding administrator and diplomat. Though some of her ideas

were over-ambitious, such as ousting the British from India or reviving the Byzantine Empire, she was usually a realist who understood the art of the possible. In 1766 C. called a Great Commission of elected representatives from all social classes (except squire's peasants) and nationalities (except nomadic ones) which was to prepare the ground for a new legal code. C. herself drew up instructions for the guidance of this Commission, largely based upon Montesquieu. The work of the Commission exposed the evils of the existing administration and showed the universal desire for greater efficiency and for the extension of local gov., but few reforms were in fact achieved, the most notable being the reorganisation of the prov. administration and the extension of self-gov. in the tns. On the other hand she granted the famous Charter to the Gentry (1785), which greatly increased their privileges. This exacerbated discontent in the country, which had already led to the peasant revolt under Pugachëv (q.v.) in 1773. The outstanding events of C.'s reign in foreign affairs were 2 successful wars with Turkey, a war with Sweden, and the 3 partitions of Poland, in which Russia made great territorial gains. See G. S. Thomson, *Catherine the Great and the Expansion of Russia*, 1947.

Catherine de' Medici (1519-89), Queen of France, daughter of Lorenzo de' Medici, and wife of Henry II of France. She married, in her fourteenth year, the second son of Francis I. For many years she lived childless and obscure, being overshadowed by Diane de Poitiers, her husband's mistress, and she played little active part in state affairs until the accession of her son, Charles IX, in 1560, when she became regent. A born intriguer, she attempted to play off the Guise and Huguenot factions against each other in order to ensure the supremacy of her own family, and probably in the hope (unsuccessful, as it transpired) of preventing civil war. When she considered the Huguenot power to be increasing to the detriment of her own influence, she instigated the murder of Coligny and thus precipitated the Massacre of St Bartholomew (1572); though it is doubtful if C. had intended to encourage a massacre of these proportions. During the religious wars she tried to curb the power of the Guises, but at her death the country was in a state of anarchy and confusion. C. had all the Medici love for art, and she found time to take an active part in planning the Tuilleries, in enriching the Bibliothèque Nationale, etc. See life by R. Roedeve, 1937.

Catherine Howard, see HOWARD, CATHERINE.

Catherine of Aragon (1485-1536), Queen of England; first wife of Henry VIII (q.v.). She was b. at Alcalá de Henares, the daughter of Ferdinand and Isabella of Spain. She first married Arthur, Prince of Wales, elder son of Henry VII, in 1501, but he d. in 1502. The following year she was betrothed to Arthur's

brother, Henry, 6 years her junior, papal dispensations for the union being obtained. But the marriage did not take place until after Henry's accession, 1509, and between 1504 and 1509 C. was virtually a prisoner in England. The marriage seems to have been happy at first, though the royal couple differed widely in temperament as well as age; but of C.'s 5 children only one, a daughter (later Mary I), survived infancy and Henry had already had a number of illicit love affairs before his meeting with Anne Boleyn (q.v.). Henry's infatuation for Anne, and his genuine desire for a male heir which C. now seemed unlikely to bear him, made him determined to have his marriage with C. annulled and to marry Anne instead. In 1526 Henry informed C. that until the validity of their marriage was confirmed their relationship should cease; in 1529 annulment proceedings opened before Campeggio. C. appealed to Rome and the court was adjourned. In 1531 Henry finally left C. who spent the rest of her life strictly confined in various country houses, forbidden to see her daughter, and provided only with the slenderest resources. Meanwhile Henry repudiated papal supremacy and an Eng. eccles. court pronounced his marriage with C. null; in 1534 the Pope pronounced it valid. To the end of her life C. refused to acknowledge the annulment. She is buried in Peterborough Abbey. *See* lives by F. Claremont, 1939, and G. Mattingly, 1942.

Catherine of Braganza (1638-1705), Queen of England, daughter of King John IV of Portugal. She married Charles II of Great Britain in 1662. C. brought Charles an enormous dowry, together with Bombay and the fortress of Tangier in Africa, and commercial privileges for Eng. merchants in Portugal, but the marriage was unpopular in England largely on account of C. being a Rom. Catholic, though in fact she had no apparent influence on her husband's policies. Charles appears to have been fond of her, while neglecting her for his many mistresses, and supported her against Whig criticism, 1678-80. She returned to Portugal in 1693. *See* life by J. Mackay, 1937.

Catherine of Valois (1401-37), Queen of England, daughter of Charles VI of France. In 1420 she married Henry V at Troyes. Their son became Henry VI. After Henry's death C. came under the influence of Owen Tudor, gave him a position in her household and is said to have married him secretly, though this is not certain. Their son Edmund was the father of Henry VII. When Tudor was imprisoned, 1436, C. retired to Bermondsey Abbey, where she d.

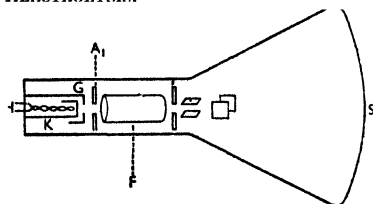
Catherine Parr, *see* PARR, CATHERINE.

Catheter, instrument used in surgery for the purpose of allowing the passage of fluids through tubes in the body which for some cause have ceased to allow passage naturally. Thus it is introduced into the urinary bladder of persons unable to pass their urine or into the Eustachian tube

when it is stopped up by catarrh. It is a hollow tube made either of metal or of a more flexible material such as gum elastic or rubber. The urinary C. in the male is about 10 in. long and curved into a requisite shape, which in the case of the flexible materials can be produced by warming and bending. In the female the tube is shorter (being only 5 in.) and straighter. The introduction of the instrument must be carefully performed. The Eustachian C., which is generally of metal, is curved slightly at one end and about 7 in. in length.

Cathetometer, instrument for the accurate measure of small differences of height or of level between 2 near points. It consists of an upright graduated bar, carefully levelled in a vertical position. The 2 points or levels are observed in a horizontal telescope which traverses on the vertical bar, and the distance between the levels is the difference between the scale readings for the 2 positions of the telescope. As constructed for the physicist, with numerous additional arrangements to ensure accuracy, such as cross-wires and the micrometer eyepiece of the telescope, the C. records with a high degree of accuracy. One of the most common uses is in the measurement of the difference between the levels of the mercury in the tube and in the cistern of a barometer.

Cathode, or **Kathode**, negative pole of an electric cell, the conductor by which an electric current leaves an electrolyte; the opposite of the anode, which is the positive conductor. *See* ANODE and ELECTROLYSIS.



ELECTRODE ARRANGEMENT OF AN ELECTROSTATIC CATHODE-RAY TUBE

Cathode-Ray Tube, or **Braun tube**, originally vacuum tube with large bulb ending in fluorescent screen (*see* diagram). At the narrow end is a cathode *K* heated by a filament, *H*. The heated cathode emits a stream of electrons accelerated by a perforated anode, *A*; the stream is focused by a second anode, *A'*, and produces a luminous spot on impinging on the screen *S*. The electrode *G* controls 'brightness.' In this simple form the C.-R. T. is an excellent tool for experimental demonstrations. The action of magnets, and coils or wires carrying current, on the electron stream (i.e. the current in the tube) can be shown by simple appliances outside the tube; 3 coils placed against the tube with their axes 120° apart and connected to a 3-phase supply show the rotating field: the spot becomes a circle.

In its modern form shown in the diagram the tube has deflecting plates and a more elaborate anode system. See OSCILLOGRAPH and TELEVISION.

Cathode Rays, streams of very swiftly moving particles emitted normally from the surface of the cathode in a vacuum discharge tube. The particles have been demonstrated to possess a negative charge and considerable momentum, and the work of J. J. Thomson in 1897 showed that the ratio of their charge to mass is a constant. This and other evidence was sufficient to identify them as fundamental constituents of all atoms, and they were called electrons (q.v.) because they had a charge equal to that found on a single ion in electrolysis, which unit had been called an electron by Stoney in 1891. A beam of C.-R. is deflected by a magnetic field precisely as a wire carrying an electric current would be, i.e. it moves in a direction at right angles to the beam and to the field. See also RADIOACTIVITY and ELECTRON.

Catholic Apostolic Church, designation of a body of Christians who are mistakenly known under the name of Irvingites, given to them on account of their connection with the Rev. Edward Irving (q.v.). Irving, when a minister of the Scottish Church, Regent Square, London, turned in the direction of mysticism. He insisted that the miraculous gifts of the early church were to be continued throughout the new dispensation. In 1832 Irving was deposed from the ministry, and, when ejected from his church, his congregation went with him to become the first of the 'catholic apostolic' churches in London. At meetings held for prayer, certain persons having prophetic gifts indicated 6 others as 'called to be apostles of the Lord.' In 1835 6 others were designated in the same manner to complete the number 12. These 12, having the special spiritual powers of apostleship, could alone ordain and interpret the sayings of the prophets. As time went on others were ordained to the ministries of prophets, evangelists, and pastors, and deacons also were ordained to look after temporal affairs. The last of the 12 apostles d. on 3 Feb. 1901. The liturgies of the C. A. C. are based on those of the Anglican, E. Orthodox, and Rom. Churches (qq.v.). The church possesses a fine Gothic building in Gordon Square, London.

Catholic Church (Gk *katholikos*, universal), name adopted in the 2nd cent. by the Christian Church to indicate the whole body of believers. It arose in special distinction from the Jewish Church, which was intended for one nation alone, whereas Christianity (q.v.) was for the whole earth. As heresies arose, the great test of the truth came to rest in the unanimity which the various churches founded by the apostles showed as regards the apostolical traditions which had been handed down. Hence the C. C. was the term used to denote the body of orthodox Christians, in opposition to local sectaries. This notion of orthodoxy acquired prominence in the E. where the Holy Orthodox

Church claims to maintain the anct faith. In the W. the growth of the papacy as the centre of church gov. led to the word Catholic meaning 'in communion with Rome.' When the Reformation came, the Reformers did not all repudiate the term Catholic, and the Eng. Church retained the word in her creeds. But by common consent the word Catholic continued to be applied to the Rom. Church, and this usage continues on the Continent. See ROMAN CATHOLIC CHURCH.

Catholic Creditor, in Scots law, where X has a prior security over two or more subjects belonging to a debtor and Y has a postponed security over one of these subjects X is termed the catholic and Y the secondary creditor. A C. C. may realise simultaneously all his securities if necessary for fully satisfying his debt. But he is bound to allocate his catholic (Gk *katholikos*, universal) debt proportionally against all the secondary creditors affected by it, and not in such a way as to prefer one co-creditor to another. If he takes full payment out of one security to the exclusion of the other securities, he must assign the other securities to the secondary creditors.

Catholic Emancipation, the freedom from civil disabilities which was granted to Rom. Catholics in the U.K. and Ireland at the end of the 18th cent. and beginning of the 19th. After the Reformation Rom. Catholics in both kingdoms suffered under many disabilities and were harassed by numerous penal restrictions and regulations. The saying of mass in England was made felony for a foreigner and high treason for a native. Rom. Catholics were not allowed to purchase land, and persons educ. in the Rom. faith were incapable of inheriting property. In Ireland Rom. Catholics so holding land could be dispossessed without ceremony by the nearest Protestant relative. Rom. Catholics were not allowed to undertake the guardianship even of Rom. Catholic children. In 1778 a Bill by Sir George Saville was introduced to repeal the most oppressive of these regulations in the case of those Rom. Catholics who would submit to a certain test. This test required the denial of various doctrines subversive of the State, such as: that no faith is to be kept with heretics; that princes excommunicated may be deposed or put to death; and that the Pope has a temporal jurisdiction in England. The Bill was passed at the cost of the Gordon Riots in England. In 1791 another Bill was passed still further alleviating the Rom. Catholic burden, and in 1792 this Act was made to include Scotland. Irish Catholics had had some of their disabilities removed in Acts of 1774, 1778, 1782, and 1790. But Catholics still could not sit in Parliament. In 1824 a Rom. Catholic Association was formed in Ireland under the influence of O'Connell, stimulated by the fact that many of the reforms which had been promised in order to bring about the Union in 1801 had not been carried out. In 1829 the Duke of Wellington reluctantly came to the conclusion that the

peace of the empire would be imperilled if the numerous disabilities were not removed, and the Catholic Emancipation Bill was carried, followed in the same year by the Catholic Relief Bill. This gave Rom. Catholics the right to sit in the House of Parliament, and gave them admission to most civil offices. At the present time no Rom. Catholic may be sovereign, regent, lord chancellor, lord keeper, of Great Britain, or lord high commissioner to the Church of Scotland.

Catholic Epistles, or **Epistles General**, name given to 7 epistles in the N.T. which are addressed to the Church Universal and not to the Christians at particular times, a title which distinguishes this group of epistles from those bearing the name of Paul. Of the 7 epistles (James, Jude, Peter (2), and John (3)) only John I and Peter I were at first generally received as canonical.

'**Catholic Herald**,' weekly Catholic newspaper, founded in 1887 by the late Charles Diamond. It was reorganised, after its founder's death in 1934, as a religious jour. especially concerned with the Catholic view on current world and home news and on the prin. formative influences cinema, etc. It makes a special feature of our days: education, literature, art, of readers' own views.

Catholic Truth Society, founded in 1884 in London by the late James Britten (1846-1924) in order to assist all Catholics to a better knowledge of their religion and to spread amongst non-Catholics information about the Catholic faith. The society is dependent on the voluntary subscriptions of its members. From humble beginnings it has grown into a world wide organisation with over 30,000 members. There are nearly 500 titles in the current C. T. S. catalogue, including the cheapest complete Bible in the world, pub. in 1956 at 6s. The society distributes over 2,800,000 of its pubs. every year throughout the Eng.-speaking world.

Catholic University of America, opened at Washington, D.C., in 1889 with papal sanction from Leo XIII, under the direction of the bishops of the U.S.A. In addition to the college of arts and sciences, it has schools of engineering and architecture, philosophy, law, social science, nursing education, sacred theology, and canon law, and social service. The teaching staff numbered 381 in 1955; the students 3835. The univ. library contained 450,000 vols.

Catholic University Question (Ireland). The demand of Irish Rom. Catholics for the estab. of a Rom. Catholic univ. in the 19th cent. met with parliamentary opposition for many years. Disraeli (q.v.) basing his personal opposition to the estab. of such a univ. on the fact that the Irish Catholic members had supported the disendowment of the Protestant Church of Ireland. The univ. of Dublin (see TRINITY COLLEGE, DUBLIN) was a Protestant foundation, and the Irish Rom. Catholics did not feel that their requirements were met either by it or by the Queen's Univ. (founded 1850), which was reconstituted as the Royal Univ. in 1880;

there were also Queen's Colleges at Belfast, Cork, and Galway. A royal commission was appointed in 1901 to inquire into the C. U. Q.; no Irish Catholic layman sat on the commission. Its report pointed out that the Rom. Catholic pop. of Ireland which was in an overwhelming majority, was without any adequately endowed foundation, and that some scheme satisfactory to the majority would have to be formulated. The report recommended the estab. of a properly endowed and equipped univ. college for Catholics in Dublin. Notwithstanding these recommendations the C. U. Q. remained in abeyance for 2 years, until, in 1905, the matter was fully discussed in the debate on the civil service and revenue estimates. A scheme for the reorganisation of univ. education in Ireland was put forward by James Bryce (q.v.) in 1907, but was not accepted. Finally, in 1908, the Irish University Act passed (after pressure from Augustine Birrell, q.v.). The Act left Trinity College intact, while 2 new univs. were created, one in Dublin (now the National Univ. of Ireland, see IRELAND, NATIONAL UNIVERSITY OF) and one in Belfast (see QUEEN'S UNIVERSITY). The former involved the endowment of another college, and the incorporation of the Queen's Colleges at Cork and Galway. The majority of the Senate of the new univ. (in Dublin) was Rom. Catholic. There were to be no religious tests.

Catholics, Old, members of a group of self-governing national Churches, possessing valid episcopal orders and united by their acceptance of the Declaration of Utrecht (1889) as their dogmatic (Jansenist) basis. They include (1) the Old Catholic Church of Holland, which separated from Rome in 1724; (2) the Old Catholic Churches of Germany, Switzerland, Austria, and Czechoslovakia, which originated in a revolt led by Dollinger (q.v.) against the Holy See in 1870; and (3) the Old Catholic Churches which sprang up later among the Slavonic nations. The Old C. have retained some elements of Catholic doctrine; but they reject papal infallibility and jurisdiction, and clerical celibacy. They also insist on voluntary confession, on the use of the vernacular in public worship, and on communion in both kinds. They have close relations with the Orthodox Churches of the E., and (since 1931) intercommunion with the Church of England. In 1948 the Archbishop of the Polish Old C. was received into the Rom. Catholic Church. The sect was estab. in Britain (1908) by a mission from Utrecht. In April 1957, when the Brit. branch had only 7 clergy and 1 public place of worship, negotiations were in progress for its re-union with Rome. See C. B. Moss, *The Old Catholic Movement*, 1948.

Catholikos: 1. The title of the head of the Armenian Church (q.v.) and of the Nestorian (q.v.) Patriarch.

2. In the later Rom. Empire the title was given to the receiver-general, or deputy receiver, in a civil diocese. In its general sense it seems to have been applied to the superintendent-general of

missions or of churches on and beyond the borders of the Rom. empire.

Catilina, Lucius Sergius (c. 108-62 BC), member of an impoverished patrician family. He first appears as a partisan of Sulla (q.v.), taking part in the proscriptions of 82 BC. Though possessed of high intellectual qualities, his life presents a compound of cruelty and intrigue. Praetor in 68, he was governor of Africa in 67-66 BC. Disqualified from suing for the consulship by an impeachment for extortion in his prov., C. embarked on his first conspiracy, which failed owing to his own impatience. Having been acquitted on the charge of extortion, he failed to win the consulship for 63 BC. When Cicero was elected he took advantage of the prevailing unrest to organise a more extensive conspiracy, which was defeated through the vigilance of Cicero. Immediately after the latter's first Catilinarian oration (8 Nov.), C. left Rome. In the first days of 62 his army opposed the gov. forces near Pistoia. C. fell in action. See E. G. Hardy, *The Catilinarian Conspiracy*, 1924.

Catons, see **IONS**.

Catkin, or **Amentum**, deciduous, crowded, often greenish, more or less pendulous spike-bearing male or female apetalous flowers. In the oak, hazel, and sweet chestnut there are male catkins, and both male and female in the willow, poplar, and birch.

Catmint, or **Catnip**, name applied to sev. plants on account of the fondness of cats for their odour, particularly applied to *Nepeta cataria*, a species of Labiatae which is related to the ground-ivy; the flowers are white, spotted with pink, and are arrayed closely together. Other species of *Nepeta* are also called C., while *Anisomeles malabarica* and *Calamintha officinalis*, both belonging to the Labiatae, receive the names of Malabar C. and medicinal catalmint or C. respectively.

Cato, Dionysius, reputed author of *Dionysii Catonis Disticha de Moribus ad Filium* (3rd or 4th cent. AD), a book of moral injunctions and precepts which was very popular in the Middle Ages. It was trans. into many languages, and Caxton printed a version at Westminster in 1483. Each apophthegm is enclosed in a couplet of dactylic hexameters. The tone of the book may be described as monotheistic rather than Christian. There is an amusing reference to it in Chaucer's *Nonne's Tale*. Nothing at all is known of the writer. There is an ed. with trans. by A. M. Duff in *Minor Latin Poets* (Loeb Library, 1934). See W. J. Chase, *The Disticha. A Famous Medieval Textbook*, 1922.

Cato, Marcus Porcius (234-149 BC), 'the Censor,' Rom. statesman, b. at Tusculum. He was brought up, like his plebeian forefathers, as a farmer; but in consequence of the patronage of L. Valerius Flaccus he became successively quaestor (204), aedile (198), praetor (198), and consul (195) with Flaccus. As a soldier he was distinguished for his valour and for his extreme severity both during the Punic war and his command in

Sardinia. Both in the final defeat of Hannibal at Zama (202) and in the battle of Thermopylae (191), he played a conspicuous part, whilst his cruel subjection of the Celtiberians in Spain (194) earned him a triumph. In his projects of reform and in his enmities he showed a like passion and sincerity. It seems certain that he was largely responsible for the prosecution of the Scipios for corruption—during the Carthaginian war he had often reproached the famous general for his luxury—and his incessant cry of 'Delenda est Carthago' shows how much the prosperity of the rival city had aroused his hatred. His reforms were largely in the shape of sumptuary laws, designed to check the growing extravagance of dress and banquets. These were carried out during his censorship (184), when he also thoroughly revised the senatorial and equestrian lists so as to keep out upstarts and foreigners. Both Cicero and Livy are fond of citing C. as the model of a Rom. citizen in the republican days. His personal integrity and rugged simplicity, his stern sense of duty and rigid discipline, his frank hostility towards the new Hellenic culture, and his narrow patriotism became proverbial. In his contemptuous dismissal of Carneades and the other Gk philosophers, and in his jealous championship of the family, he showed his extreme conservatism. His *De Re Rustica*, a treatise on agriculture, has literary merits and an historic interest, which cause the reader to regret that his *magnum opus*, entitled *Origines*, which was a comprehensive hist. of Rome, should have been lost.

Cato, Marcus Porcius (95-46 BC), known as Cato the younger, surnamed *Uticensis* (from the place of his death), Rom. statesman and Stoic philosopher. After serving as a military tribune in Macedonia (67), he accepted a prov. appointment in Asia, where he learnt so to appreciate the merits of Lucullus, that he gladly supported his claims to a triumph against the vainglorious ambitions of Pompey. C. opposed Caesar's candidature for the consulate in 59, and, later, his agrarian law for rewarding his veterans. Nevertheless it was at Caesar's instigation that he was dispatched to settle the affairs of Cyprus in 58. C.'s praetorship in 54 was characterised by his sturdy effort to suppress bribery. He opposed Caesar during the civil war. After the battle of Pharsalus, he led a small force into Africa, eventually shut himself up in Utica, and there committed suicide after Thapsus. His last hour was spent in reading Plato's dialogue on the soul's immortality. Posterity has perhaps magnified his fame because he was the last of the old order of Romans to die for a national ideal which he could not realise was an anachronism. Nothing gives greater insight into his character than a remark of Cicero's to the effect that he acted as if he were in the rep. of Plato instead of in the drags of that of Romulus.

Cato Street Conspiracy, plot formed in London in 1820 to murder Castlereagh and the rest of the gov. at a dinner at

Lord Harrowby's on 23 Feb., to set fire to London, to seize the Bank and the Mansion House, and proclaim a provisional gov. The plot was revealed to the police by one of the conspirators named Edwards, and the ringleaders were arrested. Thistlewood, the chief, Ings, Brunt, Tidd, and Davidson were hanged, and 5 others transported for life. The plot was so called from the place of meeting in Cato St, Edgware Rd.

Catoptrics, that part of the science of light or optics which deals with the laws of reflection. See REFLECTION AND REFRACTION AND LIGHT.

Catorce, tn of Mexico, in the state of San Luis Potosí, 120 m. N. of the tn of that name. It produces silver and antimony, and has gold, lead, and copper deposits. Pop. 2000.

Catostomus, genus of fishes of the family Catostomidae, which are peculiar to the rivers of N. America. They are distinguished from their ally, the carp, by having their lips thick and pendent, no barbels, a long dorsal and a short anal fin.

Catrine, tn in Ayrshire, Scotland, situated on R. Ayr, 2½ m. SE. of Mauchline. The main industry is cotton manufacturing. Near by are Ballochmyle House and Catrine House, both associated with Robert Burns. Pop. 3000.

Cats, Jakob (1577-1660), Dutch poet and humorist, studied law at Leyden, and later won renown as an advocate for his defence of a witch. Part of his life was spent on a farm at Grijskerke in Zeeland. Driven from his farm by the collapse of the dykes, he was for some time stipendiary magistrate at Middelburg and Dort, whilst in 1636 he became grand pensionary of Holland, and 12 years later keeper of the great seal. A knighthood was one result of his embassy to Charles I of England in 1627. The somewhat archaic character of his style and subjects has deterred many a student from reading his poems. He gained great popularity, however, and his many disciples called him 'Vader Cats.' His *Houwelyck* (1625), and the *Trou-Ringh* (1637), a collection of tales about curious marriages, as well as his *Spiegel van den ouden en nieuwen Tijd* (1632), well represent the purity of his morals and diction, his homely wit and power of shrewd observation. His *Complete Works*, in 19 vols., were issued in 1790-1800. See G. Kalf, *Jakob Cats*, 1901, and H. Smilde, *Jakob Cats in Dordrecht*, 1938.

'**Cat's-eye**,' see TRAFFIC REGULATIONS AND SIGNS.

Cat's-eye, stone so called from its likeness to a cat's eye. It is another variety of chrysoberyl, and is found in Ceylon, China, Brazil, and Malabar. The stone, when cut only but not polished, if the structural arrangement is perfect, produces a narrow and distinct line of light which much resembles that emanating from the interior of the eye of a cat. The colour of the stone varies; it is grey, brown, and black, with yellowish or greenish tints, or sometimes it is the palest apple-green or a deep olive colour. The

line of light when held in front of the eye should cross the centre of the dome and be narrow and well defined. The chatoyant line is usually white. The hardness of the C. is 8-5, and the sp. gr. 3.5 to 3.8. The lustre is brilliant with iridescent ray—the cleavage is imperfect, the fracture conchoidal. It is, moreover, doubly refractive. It is soluble with borax or salts of phosphorus, but untouched by acids. There are 3 varieties of C. Quartz C. is softer, 7 instead of 8-5, and less lustrous than the C. belonging to the chrysoberyl variety. There is also Crocidolite C. or tiger's-eye, which is cut and artificially coloured. It is a much softer stone and of a silky lustre.

Cat's-tail Grass, the popular name of *Phleum nodosum*, slender perennial grass, with cylindrical, blunt panicles, native to Britain, Europe, Algeria, and N. Asia, in pastures and grassland.

Catskill Mountains, large range of well-wooded mts belonging to the Appalachian system of N. America; they are situated chiefly in Greene and Ulster cos. and form one of the most beautiful situations in America. Their sides are very steep, and they attain to a height of nearly 4000 ft in some places. The chief peaks are Slide Mt (4204 ft) and Hunter Mt (4025 ft). The vil. of C. lies in the state of New York, and is 34 m. distant from Albany. It is the cap of Greene co.

Catt, Carrie Chapman (1859-1947), Amer. suffragist, b. Ripon, Wisconsin, U.S.A. She organised the Iowa Woman Suffrage Association in 1890, and then transferred her activities to the National Amer. Woman Suffrage Alliance. She served as president of that body, 1900-4, and was again elected in 1915. Later she became the leader in the campaign to submit a woman suffrage amendment to the Federal Constitution. This was adopted by Congress in 1919 and ratified in 1920. It gave the franchise to every female in the U.S.A. aged 21. Mrs C. was president of the International Woman Suffrage Alliance, 1904-23. She won an award in 1933 for bringing about a better understanding between Jews and Christians. In 1935 the Turkish Gov. issued a postage stamp bearing her portrait in honour of her position as head of the International Woman Suffrage Alliance. Awarded medal of the National Institute of Social Science, 1940.

Cattaro, see KOTOR.

Cattegat, arm of the N. Sea, some 150 m. in length, joining the Skagerrak on the N. and the Baltic on the S., and bounded E. and W. by Sweden and Denmark respectively. Its sand-banks endanger navigation.

Catterick, vil. of Yorks (N. Riding), England, 4 m. SE. of Richmond. Near by is a large army camp; there is also a race-course. Pop. 2167.

Cattermole, George (1800-68), painter, b. near Diss in Norfolk. He became an associate of the Water-Colour Society in 1822; also exhibited at the Royal Academy, but is best known for his illustrations, with an antique flavour, to works by Scott, Dickens, and others.

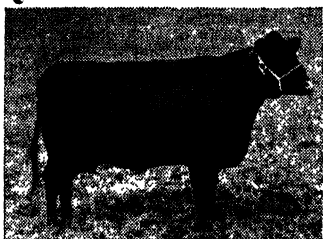
Catti, or Chatti, Ger. tribe, mentioned by Tacitus, who lived in a dist. round the higher reaches of the Weser, etc., corresponding roughly to the modern Hesse. In the first 2 cents. AD they frequently fought against Rome and were finally incorporated with the Franks in Clovis's kingdom.

Cattle. The influence of Brit. breeds of C. has been felt in all parts of the world, which in itself is evidence of their value. The Shorthorn is the most cosmopolitan breed, and the most widely distributed in these is. In most parts of the world, except its place of origin, the Shorthorn is called the Durham breed—a more suitable description since the term Shorthorn is equally applicable to a number of other breeds. In many other breeds valuable characteristics have been developed since the first great improvement wrought in the Longhorn breed by Bakewell in the latter half of the 18th cent. There is little use in discussing breeds previous to this period, for the origin of Brit. breeds from the earliest periods is still a subject of debate. Gradually, in accordance with soil and climate, local breeds—some widely spread—had estab. themselves, and where the locality, dist., or area was very similar over a sufficiently extensive country, animals acquired indigenous features and characteristics which stamped them as breeds recognisable by certain peculiarities. There were, however, many parts of the country where the soil was so diversified that no special type was found. In dists. where the soil varies frequently, and consistency in breed is met with in only small areas, outside breeds have to be adopted, whether for meat production, milk producing, or both. The Shorthorn, in particular, adapts itself to such areas, and it is found in all parts of the country. These dists. are also much associated with the breeding of cross-breeds.

C. are kept with 2 main objects, production of beef and of milk, or both, and a very common div. of the breeds is made in accordance with these. In this connection the term improved C. may be explained. Unimproved C., as a rule, fatten, and mature slowly, and yield a moderate supply of milk. The object of the breed maker or breed improver is to select animals which conduce to one or both of these purposes. To a great extent these 2 purposes are antagonistic, and where the objective is the development of beef, with its necessary accompaniment of early maturity, the milking properties usually suffer; whilst it is only the exceptional animal which combines high milking properties with good meat-making qualities. The fusing of these 2 properties, especially in the Shorthorn, has met with success. It may be noted here that some continental breeds have superior milking properties to the generality of Brit. breeds. Brit. breeds have always shown an aptitude to produce meat, and whilst the pop. of these is. was comparatively small, and beef rather than milk was needed, Brit. breeders were right in paying more

attention to beef. But the increase in pop. and in milk consumption has caused the modern farmer to direct his efforts towards increasing the milking properties. At one time only the Shorthorn, Red Polls, and perhaps Dexters were regarded as dual purpose breeds, but now a 'beefy' type of Friesian is being bred which is tending to displace many Shorthorn herds. The animals of heavy build, emphasising the features of meat-producers, are the Hereford, Aberdeen Angus, Devon, Sussex, Longhorns, Welsh C., Galloways, and W. Highlanders. The dairy breeds yielding exceptional quantities of milk in ratio to their weight are the Jerseys, Guernseys, Ayrshires, Brit. Friesians, and Keries. Among minor breeds with little influence outside the dist. to which they are indigenous are Zetland or Shetland C.

Pure breeds are in relatively small proportions to cross-breeds, or the animals of which the pedigree cannot be traced, though classed as belonging to the breeds to which they approximate. Animals, however, may be pure bred, although the pedigree may not have been kept, provided the dam is the offspring of 5 generations of dams sired by a pedigree bull. A pedigree is valuable when it records skilled mating and selection over a long period, but if it records the results of unskilled mating it may be harmful; for if bad features are perpetuated for a long series of generations, they become estab., to the prejudice of the offspring. It has been said that the Shorthorn is the most cosmopolitan breed. This results from the sev. breeds, including some of continental source, which went to form the Durham breed, subsequently known as the Shorthorn. As a grazing beast the Shorthorn is seen at its best on rich pastures. It is really a very highly bred animal, and if pasturage is very good is sure to do well; but it is not the best breed on many poor pastures. It is difficult to draw hard and fast conclusions, because experience affords conflicting evidence; but except on the richest pastures, the Shorthorn is not so well adapted to very heavy land as are the native breeds of middle horns. This is illustrated by the Sussex breed in Sussex, the Devon in Devon, the Hereford in Hereford, and on the Red Sandstone generally. Climatic conditions also have their influence, and the short-coated Shorthorn does not thrive so well under the same exposure as the long-coated W. Highlander. Nor is the Shorthorn generally so well suited to the high and wet hills as local breeds which have become acclimatised. It is evident, therefore, that where the animals have to spend a considerable portion of the year on pasturage, no one breed can be regarded as universally the best; though it may be said that the Shorthorn is the best over the greatest area. The Hereford, the Welsh, the Sussex, and the W. Highlanders may be taken as examples of breeds which thrive well on rough grazing in winter-time, even outside their indigenous dists. But the grazing value of a breed does not altogether



'Farmer and Stockbreeder'

1-4, DAIRY CATTLE; 5-8, DUAL-PURPOSE; 7-8, BEEF (not to scale)

1, Ayrshire, in calf.

2, British Friesian bull.

3, Jersey.

4, Guernsey.

5, Shorthorn.

6, Red Poll.

7, Hereford heifer.

8, Devon bull.

settle its commercial value for the farmer: the yarding capabilities have to be taken into consideration, more especially where the grazing season is short and the yarding season is long, as in the bigger arable dists., where winter grazing is almost impossible, and where C. must feed on swedes or mangold and hay. Here the Shorthorn makes its special value felt, as does the Polled Angus, another splendid beef. The Hereford, Devon, Sussex, Galloway, Red Poll, and Welsh (both the N. and S. Wales or Anglesey and Castle Martins) yard well. The grazing coos. are the rearing homes of the greatest number of calves, though, of course, dairying dists. are the chief breeding grounds. At the same time large numbers of calves are taken from their mothers very soon after birth, and are sent long distances to be weaned. The calves from the great milking dists. of the Vale of Aylesbury, Somerset, Cumberland, and other places are in great demand among raisers of heifers in other parts because of the good type of cow kept there. Farmers raising their own stock are as a rule very careful in their breeding; but the methods of the dairyman and small-holder have not always been above criticism. There is no economy, and great harm may lie, in using other than well-bred bulls. The application of artificial insemination to C. breeding has been taken up in recent years in many countries. By this means the services of the best pedigree bulls are available for breeders, resulting in calves being superior to their dams, and herds developing into first-class C. The artificial insemination centres of the Brit. Milk Marketing Board provide inseminations for both beef and milk breeds.

The cow carries her young about 9½ months, and it is regarded as being best to arrange the date of her first calving about May, so that by gaining about 2 months in each year the calving will work back into the winter months (when the price of milk is highest) by the time she is in full profit. A cow is regarded as at full profit at her third calf, and if she is bred from regularly the next 4 calves go further back, so that the period when she gives her fullest yield will be at the time of year when milk is most valuable. Ordinarily the lighter-framed milking breeds, which have little value comparatively when fat, are bred from when youngest, many stock-raisers thinking that from 2 years to 2½ years is best; but some keepers of heavier breeds think 3 years the optimum age. Where animals are bred from when young more attention must be paid to their keep than when they are older and have less growth to make. Heifers need to be strong when they breed, and should not be allowed to get into poor condition. Some cows dry off very early, and have a long off-lying period, during the first part of which they may be kept on moderate diet, but cows which milk but a short period (except through some special cause, such as illness prematurely stopping the milk flow) are rarely worth keeping on. On the other hand, some of

the very highest-bred beef-making cows, valuable for that very purpose, often milk but a short time. As the time for calving approaches the udder and teats enlarge and become firm. The appearance of the 'water bladder' indicates that calving is imminent. After calving, a thin bran mash, or water containing a little oatmeal, should be given, though when greatly distressed, gruel well fortified by a stimulant should be administered. The cow-keeper's great fear is that his cows may abort or present their calves when immature. This often takes a contagious form, causing severe loss over years, but it can be overcome by preventive inoculation. When the weather is at all fair, it is well to let the cow calve in the open, as on grass the calf is less liable to contract diseases through contact with germs, which may accumulate about buildings where cows frequently calve. The navel is often the site of such infection in newly born calves. To guard against infection the calf should have its navel dressed with antiseptic, such as carbolic oil, iodine, lysol, etc. The calf should be allowed to suckle the cow as soon as it can stand, and weakly calves should have the milk squirted or spooned into the mouth, for it rapidly invigorates them. The first milk, called colostrum or beistings, is specially suited to the digestion of the infant calf, and is very rich; and certain calves which have the colostrum are less liable to constipation and other troubles than those fed on milk from staler cows. The cow will instinctively lick a newly born calf whilst it is in a slimy condition. This acts as a form of massage, stimulating the vitality of the calf, and is generally accepted as being beneficial to the cow also. Cows sometimes become very excited on first seeing the calf, and maternal solicitude and pleasure may take the dangerous and unpleasant form of tossing or kneeling on it, frequently with fatal results. It is advisable, therefore, to be acquainted beforehand with the hist. of the animal. Until more recent years there was great loss of cows which 'dropped' after calving; i.e. had milk fever or parturient apoplexy. This is caused by the sudden and dangerous lowering of the content of calcium and other minerals in the blood stream, and the intravenous injection of suitable minerals usually brings about spectacular recoveries. When calves are brought up by suckling their mothers, rearing is comparatively simple. It is expected of a cow that she will maintain her calf and give a considerable quantity of milk besides; in fact, it is a poor milker which will not rear 2 at once. Many farmers make a cow rear 5 or more calves during the course of a milking period: 2 during the first 3 months, 2 during the next 3, and 1 subsequently. A calf at 3 months can be maintained without milk, as by that time it has a good digestion, and will do well on fresh grass and a little additional food, such as finely broken linseed cake, though skim or separated milk, if available, will be greatly to its advantage. Many farmers now withhold milk

from a very early age and feed gruels (either mixed in warm water or fed dry). Proprietary brands are manu. by sev. commercial firms and appear to be fairly satisfactory. Hay can be fed from about 3 weeks of age when the calf's digestive system begins to develop, and may improve the animal's ability to deal with bulky foods in later life. The most essential factor in rearing healthy calves is thorough cleanliness of all the buildings and utensils used. A large number of calves die from being too generously fed when they have been unduly fasted; this often occurs when newly born calves are exposed in markets, or are sent long journeys to be reared. In such cases, allowing them as much milk as they will take amounts to killing by kindness. Scour is always the dread of the calf-rearer, whether it results from chill, injudicious feeding, over-exercise, fright, or from contagion.

The treatment of the calf after weaning, and when it is independent of the cow and hand-feeding, may differ considerably, according to the object in view. The practice of allowing the calf to suckle until it is a year old, as is done with some of the highly bred animals intended for show purposes, is not possible with ordinary stock intended to be sold as beef; though those animals which are brought to considerable weights at a year or a few months older necessarily require to be fed at high pressure from birth to butcher. Winter calves do well at grass during the early summer, and in mild climates, where there is no fear of the husk or stomach worm, they may remain out until Oct.; but in cooler dists., where the land is wet and liable to husk (q.v.), it is found advisable to take them in by Sept., or as soon as fogs keep the grass wet. Many rearers prefer to keep the calves in throughout summer, but provided there is shelter from sun there is no objection to even young calves being out in June and July. When calves from 6 months upwards come into the yards they naturally receive winter fare of hay, roots, and finely ground cake; though if they receive chaffed hay or oat straw, a small quantity of meal can be given to encourage them to eat it. In the second year's grazing it is not necessary to give any extra food during summer. In some dists. young stock on grass receiving a little cake, with a small quantity of hay in severe weather, will thrive well up to Jan. if provided with shelter against wet or bad weather. In other dists. young stock is rarely seen on the grass after the early part of Oct. In the second winter, when run as stores, the animals often get nothing but the browsing of straw with roots, and 2 or 4 lb. of cake, and will do well on it. Some pastures will fatten out two- to three-year-old C. during summer without any help, and a pasture reaches the high-water mark of grazing if it will fatten out a big beast to the acre without aid. It is customary to put those most forward in condition on to the richest grazings, so that they will come on the market as quickly as possible, because early summer

meat generally sells well, as there is often a gap between the time when the yarded beasts are finished and that when the grazed beasts are ready. The second grade of C. will be fattened out after July, and up to the time when those to be fattened in the yards in winter are taken in. The falling powers of the grass will generally occasion the need for help as the season advances. The winter feeding does not materially differ from that of the previous year, except that the animals require more, and will consume, according to size, 50 to 80 lb. of roots or silage per day, and in some cases as much as a hundredweight is satisfactorily given. The hay allowance may run to a stone per day, and chaffed straw to about the same weight or more. The cake allowance may start at 6 lb., and be increased to 8 lb., adding as much meal. Very much higher quantities are occasionally given, but there is no compensatory equivalent in return for the outlay. It is certainly a mistake to increase the quantity of a rich cake, such as linseed, beyond 8 lb. Such increase as is made should be in the starchy or carbohydrate foods, otherwise there will be great liability to scour, which is nature's method of relieving the system from overfeeding. Linseed cake is highly nitrogenous, and if too much is fed can cause digestive and other metabolic upsets; also it contains a compound of prussic acid which occasionally causes poisoning in stock.

In all matters of C.-keeping the farmer has to be guided by his purpose and the nature of the food available. For this reason hard and fast rules cannot be laid down. The farmer considers whether it will pay him best to maintain his animals mainly on the raw material the farm provides, keeping them to an older age and then fattening them out, with a short period of healthy feeding, or whether he will rely largely on purchased concentrated foods. In the one case he keeps his animals as stores in good going condition; in the other he feeds them at high pressure, giving much concentrated food throughout their lives. Often the relative value of store stock and fat stock will make him alter his ordinary course. The buying of cattle at their proper value, of course, has a great effect on the profit of feeding. In some places animals are bought on their live weight, being weighed before being offered for sale. The weigh-bridge is an undoubted aid to the ordinary purchaser, but though he knows the weight, he still has to recognise the growing capabilities, the feeding powers, and the quality of the meat which will result. As regards indications of growth, animals that will grow well are generally long in the frame. Furthermore the skin and hair as results of breeding and selection indicate thriving or lack of power to thrive. In the thrifty animal the skin is loose on the ribs when gripped by the fingers, readily lifting; moreover when the lifted portion is rubbed between the tips of the thumb and finger it has a soft unctuous feel. A skin of this sort, as a rule, carries a nice soft hair, plentiful and

not harsh. A good thriving animal has a big heart girth—that is, the measurement round the body behind the shoulders is big, the ribs are well sprung, and the hinder quarter from the shoulder back to the tail is full, as should be the round and buttocks—that is the parts below the tail to the hocks. The top line and the belly line should be parallel, and from the setting on of the neck the fore part of the carcass should be well square with the hind quarter, giving the impression of a long, deep parallelogram. The fore part of the animal carries the least valuable meat, but beasts poorly developed in front rarely make good beefers. The strictly milking breeds are light in the fore quarters and full in the hind, gradually deepening from front to rear, thus providing ample room for digestion and for milk making—suggesting a wedge in shape. Looked at from behind over the back, the milking cow runs fine over the withers or shoulders, gradually widening, so as to show great width over the hips, suggesting yet another wedge shape. These two are described as giving the double wedge which a milking cow should possess.

Tuberculosis in cattle was formerly very common in Great Britain, resulting in heavy losses to the dairy farmer and butcher. Much of the milk supply was contaminated with the bovine tubercle bacillus, which was responsible for illness and deaths in young children. Happily this state of affairs is now considerably improved. Before the Second World War it was usual to estimate that 40 per cent of the C. were infected in some degree, but it is hoped and expected that at the present rate of progress the disease will be totally eradicated from Brit. C. within the next 5 or 6 years. This progress is closely related to the advances made in recent years in the manuf. of tuberculin and in the use of the tuberculin test which detects infection in apparently healthy animals. Measures for the slaughter of C. which were spreading the disease to other animals or infecting the milk supply, and for the compensation of their owners, were originally introduced in 1913, but the great stimulus given to the production of tubercle-free milk was provided by the estab. of tuberculin-tested herds and, later, of attested herds which qualified for bonus payments for milk and beef production. After the Second World War the ministry embarked on area schemes designed totally to eradicate the infection, and the official policy has already been attended with outstanding success which bids fair to reach full fruition in the near future.

Scientific methods of finding feeding standards. Different methods have been employed by investigators in order to determine the maintenance requirements of C. The German Thær, about a cent. ago, evolved a feeding standard by the simple process of feeding an animal on hay, weighing it at intervals, and so arriving at its rate of growth. The hay ration was then partly replaced by some

other feeding stuff and the amount of the substituted ingredient increased or decreased until the original rate of growth was again obtained. In this way Thær was able to measure the hay equivalents of many feeding stuffs, and then to state, empirically, the hay ration necessary to keep up a normal rate of growth. These standards were useful in their day, but when, later, chemical analysis was applied generally to the investigation of feeding stuffs, it was seen that what animals required was not a certain quantum of food per head a day, but such an amount as would ensure a certain rate of protein, carbohydrate, and fat. Rations stated in these terms were proposed by Grouven in 1859, and 5 years later, Wolff, the leading Ger. authority on feeding stuffs for animals, prepared a series of standard rations in terms of digestible protein, carbohydrate, and fat for different animals under different conditions. These standards, annually revised, were pub. in the Ger. Agric. Calendar until 1906, and were then modified by Lehmann, and these modified standards gave place 10 years later to the Kellner standards. Kellner, by the balance method of investigating metabolism, determined that the maintenance ration of a 1000-lb. steer should provide 6 lb. of starch equivalent, which should comprise a minimum of between 0.5 and 0.7 lb. of digestible protein. Previously Lawes and Gilbert, at Rothamsted, had used the comparative slaughter method for determining the relation between the consumption of fodder and the amount of vendible flesh produced, and the sources of fat in the animal body. This method definitely estab. that the chief source of fat in the body is the carbohydrate in the feeding stuff; and, further, that a fattening animal retains only about 5 per cent of the protein consumed, while a young growing beast may retain as much as 25 per cent for conversion into flesh. This method is costly and involves a great deal of labour in sampling and analysing carcasses, but after some years' intermission was once again employed in Cambridge and elsewhere in the investigation of difficult problems connected with the process of winter fattening of C. Kellner devised the apparatus known as the respiration chamber for the purpose of sampling and analysing the gaseous excreta, with the view of striking a complete balance between the constituents of the fodder consumed and the total excreta of the animal. From these and other experiments, he determined that the proportions of the main food constituents required to produce 1 lb. of fat in the animal body were: protein, 4.25 lb.; fat (in cereals) 1.90 lb.; carbohydrate, 4.00 lb. Latterly more intensive research work has modified these views and the feeding of C. has now become an estab. science (see Ministry of Agriculture pubs.).

Cattle statistics. The chief C.-raising countries are the Argentine Rep., the U.S.A., Canada, and Australia, each having a large export trade in live animals or meat or both. A general estimate of

the actual number of head of C. in the various countries of the world gives the following figures: All India, 151,000,000 (oxen), plus 45,000,000 buffaloes; U.S.A., 95,400,000; Brazil, 87,600,000; U.S.S.R., 56,600,000; Argentina and Uruguay, 53,000,000; France, 17,300,000; Australia, 15,800,000; W. Germany, 11,800,000; Union of S. Africa, 11,700,000; U.K., 10,700,000; Canada, 10,300,000; Poland, 7,700,000; Rep. of Ireland, 4,500,000. European C., however, are used chiefly for domestic consumption, and, in a less degree, for the export trade in hides and skins. Among the essentially stock-raising countries for the export trade, Argentina leads the world, as may be deduced from the fact that its production is nearly 46,000,000 C., with a pop. of 20,000,000, whereas the U.S.A., while producing 95,400,000, has a pop. over 8 times as great. More than 250,000,000 ac. in the Argentine Rep. are used for C.-raising, and production has almost doubled in the present cent. While Argentina owes its great and characteristic industry to a large extent to the introduction of C. by the Spaniards, the importation of Brit. breeds in later years has greatly fostered the industry. Over 3000 bulls, chiefly from England, were imported in the first 2 or 3 years of the present cent., and bulls to the value of over \$2,000,000, chiefly from England and the U.S.A., were imported in 1907, huge prices being paid by wealthy Argentines for the best stud bulls. Again, a large number of *estancias* are in the hands of Englishmen, and throughout the Pampas are a great many Eng. managers of estates. The favourite breed is the Durham, and it may be remarked here that Bovril C. are Durhams, a preference due, it is said, to the C. being fed on lucerne. The next favourite breed is the Hereford, almost pure bred, which have long usurped the place of the semi-wild animals of over 70 years ago. There are also some fine specimens of Aberdeen Angus, a useful breed which is a better milker than the Hereford, stands the cold, and yield beef of a high quality. For C. in Africa see TSETSE FLY. See J. Anderson, *The Semen of Animals and its Use for Artificial Insemination*, 1945; E. H. Garner, *The Cattle of Britain*, 1948; E. R. Cochrane, *The Milch Cow in England*, 1948; S. J. Watson, *The Feeding of Livestock*, 1949; C. Tyler, *Animal Nutrition*, 1950; J. Hammond, *Farm Animals, their Breeding, Growth, and Inheritance*, 1952.

Cattle Plague, see RINDERPEST.

Cattleya, genus of Orchidaceae, the species of which grow wild in tropical America. It is noted for the large and beautiful flowers, and *C. bicolor*, *C. dowiana*, *C. gramiloea*, *C. guttata*, *C. labiata*, and *C. mossiae*, and their many varieties, are easily grown in warm greenhouses in Britain.

Cattolica Eraclea, tn in Sicily (q.v.), 14 m. NW. of Agrigento (q.v.). It has sulphur works and salt-mines. Pop. 8000.

Catton, Bruce (1899-), Amer. historian,

educ. at Oberlin College, Ohio. After a career in journalism and gov. service he devoted himself to historical writing, and he is an authority on the hist. of the Amer. Civil War. Pubs. include *Mr. Lincoln's Army*, 1950; *A Stillness at Appomattox*, 1953 (Pulitzer prize); and *U.S. Grant and the American Military Tradition*, 1954.

Catullus, Gaius Valerius (c. 84-c. 54 bc), greatest of the Lat. lyric poets, b. of a wealthy family and came to Rome about 62 bc. He took little part in public life; but in 57 he accompanied the propraetor C. Memmius to Asia, and it was on this occasion that he visited his brother's tomb near Troy and wrote the celebrated lament *Mullas per gentes*. C.'s splendid and impassioned love poetry is addressed to 'Lesbia,' who may safely be identified with Clodia, sister of P. Clodius Pulcher and wife of Q. Metellus Celer. His political outbursts include a disgusting attack upon Caesar, who nevertheless treated him with the utmost courtesy. As a poet C. is remarkable for his mastery of the Lat. language, which he endows with the sweetness, flexibility, and melody of Greek, for his beautiful imitations of many Gk metres; for his sympathetic expression of every phase of feeling; and for his consummate art. His epic narrative of the marriage of Peleus and Thetis contains some fine descriptive passages. A paraphrase of Callimachus's *Lock of Berenice* and the wild pulsating *Attis* are among his masterpieces. See *Catulli Carmina*, edited by M. Schuster, 1949. There is a verse trans. in the original metres by F. A. Wright, 1926. See also A. L. Wheeler, *Catullus and the Traditions of Ancient Poetry*, 1934, and E. A. Havelock, *The Lyric Genius of Catullus*, 1939.

Catulus, Gaius Lutatius, Rom. general in the first Punic war; consul, 242 bc. In 241 he commanded a fleet of 200 ships which defeated the Carthaginians off the Aegates Is.

Catulus, Quintus Lutatius, Rom. general, and consul with Marius, 102 bc. The following year the united armies of C. and Marius defeated the Cimbrs, but C.'s part in the victory was ignored. This led to resentment, and C. joined Sulla in the civil war. He was among those proscribed by Marius in 87 bc, and committed suicide. He was a cultured man, being both a poet and an orator.

Catulus, Quintus Lutatius (c. 120-61 bc), son of the preceding; consul in 78 with M. Aemilius Lepidus, whose attempt to overthrow the Sullan constitution he opposed. His unshakeable devotion to the state led him unsuccessfully to resist the growing influence of Pompey, and also of Caesar, whom he tried to implicate in the conspiracy of Catiline.

Caub, see KAUB.

Cauca: 1. Riv. of Colombia, rising in the Andes and flowing 600 m. N. to join the Magdalena near Magangué. Its valley is fertile, healthy, and very beautiful, and is rich in minerals and forest trees. It is one of the country's main lines of communication.

2. Dept of Colombia with an area of

11,860 sq. m. and a pop. of 454,200. Gold is found there in moderate quantities. It is a rich cattle-raising and agric. area. The cap. is Popayán, an old colonial city.

Caucalis, family Umbelliferae, genus of ann. herbs with pinnate leaves. *C. lappula*, Small Bur-parsley, and *C. latifolia*, Great Bur-parsley, are introductions to Britain from S. and central Europe, and rather rare.

Caucasus, name of the great mt range extending for some 750 m. from the peninsula of Taman on the Black Sea to that of Apsheron on the Caspian. The breadth at the widest is some 150 m. From the luxuriant plateau of grasses and forests to the N., the mts rise in a succession of terraces, the parallel chains being divided by high plains cut up by deep fissures. The S. slopes towards Georgia present magnificent scenery; towards Kur they are often sheer precipices. From the central ridge, where the perpetual snow-line is 10,500 ft, 6 peaks are thrown up to over 16,000 ft. Mt Elbruz is 18,480 ft, and next to it come Dikhtau, Koshtantau, and Kazbek. One of the most famous mts is the twin-headed Ushba (15,410 ft), often called the Matterhorn of the Caucasus. Whilst the central spurs are granitic or pure granite, mica- and talc-schists and other metamorphic rocks are found. The 4 chief rive. are the Kuban and the Rion, flowing to the Black Sea, and the Terek and the Kur, flowing to the Caspian. Wolves, lynxes, panthers, and jackals, wild boars, and the auroids (*Bos urus*) are still found. Forests cover 56 per cent of the C. area. The flora is characterised by its arborescent growths, the variety of aquatic plants, and the preponderance of pines. Through the deep fissure of Dariel Gorge the Russians with great difficulty constructed a military road, which rises to 8000 ft above sea-level. The name C. is also often used to denote the whole large area comprising the C. mt range, the Kuban', Kuma, and Manych basins in the N. (the N. C.), and Transcaucasia in the S. In this sense C. includes a number of administrative divs. of the Russian Federal Rep.: Krasnodar and Stavropol' Krays, Chechen-Ingush, Daghestan, Kabarda-Balkar, and N. Ossetian Autonomous Reps., and the constituent reps. of the U.S.S.R.—Armenia, Azerbaijan, and Georgia—with a total pop. (1956) of c. 17,000,000.

The main mineral resources of C. are oil (Baku, Groznyy, Maykop), natural gas (Stavropol'), manganese (Chiatura), copper (Armenia), lead and zinc (N. Ossetia); there are also some coal (Georgia) and iron ore (Azerbaijan) deposits. The chief industries of the area are concerned with the extraction and processing of these minerals. At the turn of the cent. C. was the foremost oil-producing area in the world. Engineering has been developed largely since the 1930's. Food industries are important throughout C. Wheat and maize are the main crops, and horticulture and viticulture are widely practised. Sunflowers and tobacco are grown in N.

C., and cotton, wool, tea, and citrus fruits in Transcaucasia. The latter has long been the home of sericulture.

History. From the earliest times C. had a turbulent hist., with continual incursions of various peoples both from the S. and the N.; consequently the ethnical composition is very complex (see **RUSSIA, Population**). Parts of C. were conquered in antiquity by Scythians, Persians, the Macedonians under Alexander the Great, Romans, and Parthians, and later by the Arabs, by Byzantium, by Khazars, Cumans, Mongols, and Turks. In the 18th cent. C. became a bone of contention between Turkey, Persia, and Russia.



Paul Popper

GEORGIAN PEASANT

From the end of the 18th cent. till the 1870's Russia gradually extended her rule over the whole of C. There was much fighting in the C. during the Russian Civil war (see **CIVIL WAR, RUSSIAN**) and the Second World War (see **EASTERN FRONT**), and much discord between the various people inhabiting it. A number of peoples (Chechens, Ingushes, Balkars, Karachays, and Kalmyks) were deported from N. C. to Central Asia in 1943 for alleged collaboration with the Germans, and only rehabilitated in 1957. See further under **BOSSPORAN KINGDOM**; **CIRCASSIA**; **COLCHIS**; **COSSACKS**; **SHAMIL**; **TRANSCAUCASIA**; and the names of the individual peoples and administrative units. See A. F. Mummery, *My Climbs in the Alps and Caucasus*, 1895; D. W. Freshfield, *The Exploration of the Caucasus*, 1896; E. A. Martel, *Côte d'Azur russe*, 1908; F. Nansen, *Through Caucasus to the Volga*, 1931; D. Tutaeff, *The Soviet Caucasus*, 1942; F. Kazemzadeh, *The Struggle for Transcaucasia*, 1951; W. Kolarz, *Russia and Her Colonies*, 1954;

R. Pipes, *The Formation of the Soviet Union*, 1954.

Cauchon, Pierre (d. 1443), Bishop of Beauvais. Famous for the part he played in the trial of Joan of Arc. He seems to have been a member of the Burgundian faction but violated the obligations of his ministry by cruelty, besides espousing the Eng. cause. He was expelled from his see in 1429 and betook himself to the Eng. court. On the capture of Joan of Arc in his diocese, C. asserted his right to put her on trial, and, it is said, he resorted to the meanest infamies in order to secure her condemnation. In 1456 Joan's case was retried by Calixtus III, C.'s judgment declared null and void, and C. himself solemnly condemned.

Cauchy, Augustin Louis, Baron (1789-1857). Fr. mathematician, b. Paris. Received instruction first from his father, and was afterwards educ. at the *École des Ponts et Chaussées* (1807). Began his career as an engineer, but took up the study of mathematics, and was appointed to the chair of mathematical physics at the univ. of Turin (1831). He was loyal to the deposed king, Charles X, who made him tutor to his grandson (1833), and then created him baron. C. is renowned for his memoir on wave-propagation, for which he received the Grand Prix of the Institute of 1816. So prodigious was his productivity that he founded a jour. of his own, *Exercices de Mathématiques*, 1826-30.

Caucus, derivation uncertain. About 1725 it appeared in Boston as the name of a political club. In America it means a meeting of party managers to choose the candidates to be proposed at the forthcoming election or to select delegates for a nominating convention. In England the term is applied in a derogatory sense to such a rigorous system of party organisation as Joseph Chamberlain introduced at the foundation of the Birmingham Liberal Association in 1878, when it was almost a principle that voters must vote with their party.

Cauda-Galli Grit, term applied in N. Amer. geology to the lowest subdivision of the Devonian system. The name (literally cock's tail) is derived from a common fossil of this name, with a feathery form, and supposed to be a seaweed. See CORNIFEROUS PERIOD.

Caudata, see URODELA.

Caudefec, name of 2 places in the dept of Seine-Inférieure, France. C.-en-Caux, on the Seine, is famous for its 15th-cent. church; pop. 1600. C.-les-Elbeuf manufs. cloth; pop. 8900.

Cauderan, Fr. tn in the dept of Gironde, a suburb of Bordeaux (q.v.). It has distilleries, and a large trade in wines. Pop. 24,000.

Caudillo, Sp. for commander, a title applied especially to Gen. Franco (q.v.).

Caudine Forks (*Furculae Caudinae*), pass in anct Samnium, near the tn of Caudium, formed by 2 narrow wooded gorges, between which lay a plain, grassy, and well watered, but entirely enclosed by mts (Liv. ix). Here the Romans suffered a crushing defeat by the Samnites in the second Samnite war (321 bc).

Caudium, anct tn in Samnium, Italy, on the road from Beneventum to Capua. It was probably once of great importance as the cap. of the Caudini, but at the period of its first mention in hist., at the time of the Samnite wars, was quite insignificant. See CAUDINE FORKS.

Caudry, Fr. tn in the dept of Nord; has breweries and distilleries and manufs. textiles. Pop. 12,000.

Caul (from O.F. *cale*, a cap), close-fitting cap of network worn by women in the 15th and 16th cents.; hence a portion of the amnion or thin membrane covering the foetus which sometimes remains round the head of a child after birth. Many superstitions are connected with this retention of the C. To be born with a C. (Byron was an example) was considered lucky, and still is in out-of-the-way places. It was considered a protection against drowning either to the original owner or to any future purchaser. A C. used to fetch large sums, from £10 to £30 sometimes, among seafaring men.

Caulaincourt, Armand de (1772-1827). Fr. general, who served under Napoleon. He suffered the vicissitudes of fortune in his earlier career, for he was degraded from the rank of captain in the army and had to serve as a private. He was afterwards reinstated through the intervention of Lazare Hoche. C. was accused of being instrumental in the arrest of the Duc d'Enghien, but he stoutly denied it. He tried to dissuade Napoleon from embarking on the Russian war; he accompanied him to Poland, but was recalled to Paris. He took an active part in diplomatic service during Napoleon's regime, and was appointed minister of foreign affairs, but retired from service after the second restoration. See *Mémoires du général de Caulaincourt, duc de Vicence, grand écuyer de l'Empereur* (2 vols.), containing accounts of Napoleon's conversations, Paris, 1933 (Eng. trans. by H. Miles, 1935).

Caulfield, tn in the co. of Bourke, Victoria, Australia, 6 m. SE. of Melbourne by rail. Pop. 41,000.

Cauliflower, *Brassica oleracea botrytis cauliflora*, variety of cabbage. It is formed of a fleshy inflorescence modified into a flattened head of abortive flowers and it differs from the broccoli (q.v.) in being whiter and less hardy. It is said to have been imported from Cyprus in the 16th cent., but it is now naturalised in Britain, growing in a rich soil under more careful conditions than cabbage. When the head begins to show, the large surrounding leaves are drawn up and tied around it to make it of a very white appearance. There are sev. varieties of C., but they differ negligibly in quality.

Caulking, in wood shipbuilding, the process of driving oakum, or untwisted rope, into the seams of the outside and deck planks of a ship, and finally coating the oakum-filled seam with tar or resin, in order to render the joints of the planking watertight.

Caulonia, It. vil., in Calabria (q.v.). 45 m. NE. of Reggio di Calabria (q.v.). It is believed to be on or near the site of the

anct C. or Aulonía, a colony of the Achaei (q.v.). The exact site is unknown, and depends upon the identification of the R. Sagra, N. of which, according to Strabo and Pliny (qq.v.), was C.

Caunt, Benjamin (c. 1815-81), pugilist of Hucknall-Torkard, Notts, son of a tenant of Lord Byron. In 1835 he was defeated by 'Bendigo' (W. Thompson). In 1837 he attracted attention as a fighter by defeating W. Butler. His style was never very scientific, but he was resolute, powerful, and courageous; over 6 ft in height; 14 st. 7 lb. in weight. He became champion of England in 1838, after beating Bendigo in 75 rounds. In 1843 he became proprietor of the Coach and Horses public-house, St Martin's Lane, London.

Caunus, anct city on the S. coast of Caria, in Asia Minor, opposite the is. of Rhodes, to which C. belonged for a long period. It was the bp. of Protagenes, the painter, a contemporary of Apelles, and was noted for its fruit.

Cauquenes, tn in Chlle, S. America, cap. of the prov. of Maule, 75 m. NE. of La Concepción. It is a rural market centre, famous for its wines. Since an earthquake in 1939 it has been rebuilt. Pop. 13,000.

Caura, riv. of S. Venezuela, rising as the Moreviri in the sierras of the S. and flowing 465 m. NNW. to the Orinoco.

Caus, or Caux, Solomon (1576-1626), Fr. engineer, b. Dieppe; appointed mathematical tutor to the Prince of Wales in 1612. He entered the service of the elector palatine in 1613, and laid out the gardens at Heidelberg Castle. He returned to France and became engineer and architect to the king in 1623. His books include *Institution harmonique*, 1615, and *Raisons des forces mouvantes avec diverses machines*, 1615, in which he describes the process of machine movement propelled by steam with so much resemblance to that of Della Porta that the invention of the steam engine has been ascribed to him by some writers.

Cause, Causation, Causality. In physical science the truths to be discovered generally relate to the connection of C. and effect, and we usually call them 'laws of causation' or 'natural laws.' By the 'cause' of an event we mean the circumstances which must have preceded in order that the event should happen. Nor is it generally possible to say that an event has one single cause and no more. There are usually many different things, conditions, or circumstances necessary for the production of an effect, and all of them must be considered C.s or necessary parts of the C. Aristotle distinguished 4 kinds of C. for the existence of a thing: (1) The Material C., the substance of matter composing it. (2) The Formal C., the pattern, type, or design, according to which it is shaped. (3) The Efficient C., the force employed in shaping it. (4) The Final C., the end, motive, or purpose of the work.

Causality is considered in the problem whether reality exists at all beyond our own thoughts. Thus Descartes held that the certainty that reality exists could be

reached through the medium of causality. Empiricism maintains that the supposed truth that every event must have a C. is derived in a sense from experience; for it could not very well be supposed to be in the mind of anyone who had not witnessed instances of causation. But critics of empiricism ask whether it be really true that every event must have a C., in the future as well as in the past, and affirm that all that mere experience could tell us would be that certain particular events in the past have had a C. Locke includes causation among the truths that are necessarily and universally true, i.e. truths that are due to some capacity of the mind that goes beyond the mere collection of past experiences. The Idea of C. enters into the consideration of the belief in an identical self, another important problem in the growth of empirical philosophy. The necessity of the causal relation conditions Berkeley's advance from the mere existence of ideas to his conception of the world as a universal and rational system of signs, dependent upon God. He found, as he thought, a basis for the reality of causation, in that free activity of Spirit, which is rationally intelligible, though not picturable to the imagination. But this position still leaves unanswered the question: What is the impression from which the Idea of C. is derived? Again, if the belief in the necessity of a C. does not go back to any intuitive or demonstrative truth, it must come from observation and experience, a position which Hume considers in the form: Why do we believe that any particular C. will necessarily be followed by some particular effect? And the only reason there can be is that we have found this effect to follow in the past. Kant agrees with Hume, that necessary and universal judgments go beyond experience; but Hume denies the existence of such judgments, whereas Kant affirms their existence and demonstrates that in mathematics and physics necessary *a priori* judgments are constantly made and that therefore their possibility is satisfactorily explained. Hegel partly supports Kant's phenomenalism, agreeing that causality is a category (q.v.), but holds that a series of C.s never goes back to an original C., but only to an infinite regress of finite C.s, none affording an ultimate explanation. See also KNOWLEDGE and SENSATION and SENSATIONALISM.

Cause Célèbre, term used to signify any lawsuit of great public interest or importance apart altogether from any question of legal principle, e.g. the Tichborne claimant case, the Joyce treason trial, the Dreyfus case, the 'Brides in the Bath' case. The expression C. C., according to Wharton, was the title of a series of reports collected by Gayot de Pitaval of decisions of interest in Fr. courts in the 17th and 18th cents.

Causerie (Fr.), short, informal article or lecture on any subject of literary interest, whether art, the drama, or literature itself. The name owes its origin to the *Causeries du lundi* (Monday Talks) of Sainte-Beuve

(q.v.), which, however, often cease to be informal and become very elaborate essays. Matthew Arnold frequently used the *C.* form of essay, and it has become a regular feature of many periodicals and newspapers.

Causse, *Les* (Lat. *calx*, lime), plateaux in France, sloping westward from the Cévennes (q.v.) in the depts of Lozère, Aveyron, Gard, and Hérault. They are of limestone formation, dry, sterile, and cut by numerous streams, the Tarn, Jonte, and Dourbie among others, into deep canyons which divide the main plateau into 4 main and sev. smaller *C.* The chief are the *C.* of Sauveterre, Méjan (4200 ft at its highest point), Noir, and Larzac. Surface pits, underground streams, and stalactite caves are a great feature of the dist. Owing to the sterility of the soil and the rigours of the climate there are few industries; the chief is the rearing of sheep from whose milk Roquefort cheeses are made. On the S. border of the Causse Noir is 'the dolomite city,' Montpellier-le-Vieux.

Caustics: 1. In chem., the name given to substances which have the power of corroding or burning up living tissues. They do through their avidity for water, which is necessary to the tissues, and the extraction of which causes death. The most commonly used is silver nitrate or lunar caustic, which is employed to destroy warts, cancerous growths, poisons, etc., and leaves the surface black after operation. The caustic alkalis are caustic potash and caustic soda, the hydroxides of potassium and sodium respectively.

2. In optics, are curves or surfaces of increased illumination formed by the reflection or refraction of light at a surface. They are produced by spherical aberration. When a narrow pencil of rays of light is incident at the centre of a lens or mirror, all the rays are brought to one focus, but if the pencil is broad this is not the case, the rays from the periphery or margin coming to a focus at a different point on the axis from those from the centre. Thus, if we take 2 rays arriving at points in the lens at different distances from the centre, after refraction they will cross one another before crossing the axis. At this point of intersection there will be increased illumination, and the surface formed by the intersections of the whole series of rays is a surface of increased illumination known as a caustic surface, and converging at a point on the axis known as the focus. If a section of this surface is taken through the axis in any plane it will take the form of a cuspidal curve, called a caustic curve, with its point at the focus. A similar effect is produced when a broad pencil of light meets a reflecting surface, and the curve is then more easily seen and generally observed. Thus, when light is shining on a cup of tea, the tea surface cuts the caustic surface in a caustic curve seen as a bright curve on the tea culminating at the bright focal point at the cup.

Cauterets, Fr. spa in the dept of Hautes-Pyrénées, in the Lavedan valley. It has warm sulphur springs, and is a

climbers' centre for the Pyrenees. Pop. 1000.

Cautery, name given to an instrument or a process for heating or burning the tissues of the body. It provides counter irritation over an inflamed part, destroys diseased or dead tissue, or, in some cases where a white heat is applied, is useful for performing operations in parts which are either difficult to get at or vascular in nature. Its application near a bleeding artery is very efficient to check the flow of blood. There are various forms of *C.*, and the heat applied in them varies according to the nature of the operation to be performed. The *actual C.* is an instrument with a blade or head of steel or platinum heated in a lamp or fire before application. The *thermo-C.*, as in the form called Paquelin's *C.*, has a hollow head kept hot by means of a contained benzol lamp or the passage of hot vapour. *Galvano-C.* contains a wire or wires along which an electric current passes, so that the heat emitted can be varied by altering the strength of the current. The *Galvano-C.* is used in modern practice.

Cautin, prov. of S. Chile, producing wheat, cattle, lumber, tan-bark, and fruit. It is traversed by the Río Toltén, forming its S. boundary, and the *C.* or Río Imperial, which rises in the Andes and flows 100 m. westwards to the Pacific. Cap. Temuco on the Río *C.* Area 5519 sq. m.; pop. 321,600.

Caution, or **Cautionry**, in Scots law, means an obligation by which one person becomes pledged as security or surety for another, either to do a certain act or pay a sum of money, or as guarantor for the good conduct or fidelity of the other. Such obligations must always be in writing, otherwise they are unenforceable. As in the Eng. law of suretyship so in the Scots law respecting a *C.* the *cautioner* is under no greater liability than the prin. debtor or person for whom he answers. The cautioner where sued by the third party or creditor has a right to obtain relief against the prin. debtor. The cautioner, where bound as full debtor for the prin. debtor, or jointly and severally with the latter, may be sued for the whole debt, and no longer, in the absence of any stipulation to the contrary, has any 'benefit of discussion,' i.e. right to call upon the creditor to demand payment from the prin. debtor besides registering the debt or charge. The cautioner is exempt from any further liability where the prin. debt comes to an end or where the creditor alters the position of the prin. debtor without obtaining the cautioner's consent, as, for example, by giving him time to pay or discharging him altogether.

Cautley, Sir Proby Thomas (1802-71), soldier and engineer, b. Suffolk. He served for some years in the Bengal artillery until he undertook the reconstruction of the Doab Canal. His great work was the construction of the Ganges Canal, a masterpiece of engineering, opened in 1854.

Cauvery, see **KAVERI**.

Caux (so called from the chalk soil) is the name of an old dist. corresponding to

that of the modern Havre, Dieppe, and Yvetot. It is in Normandy, facing the Eng. Channel. Its people live by pasturage and agriculture.

Cava de' Tirreni, It. tn, in Campania (q.v.), 3 m. NW. of Salerno (q.v.). It stands 980 ft above sea level, in a fertile and beautiful valley surrounded by high hills, and is a popular holiday resort. It has a cathedral, and 1 m. SW. is the famous Benedictine abbey of La Trinità della Cava, founded 1025, which possesses valuable archives. C. has a cotton-weaving industry and other textile manufs. Pop. (com.) 39,000.

Cavaignac, Jacques Marie Eugène Godefroi (1853-1905), Fr. politician, son of Louis Eugène C. He became republican deputy for Saint-Calais (Sarthe) in 1882; served as under-secretary of war (1885) and as minister of marine and of the colonies under President Loubet (1892). He was minister of war in the Brisson Cabinet, 1898, when he played a prominent part in the Dreyfus (q.v.) case. He discovered the document, which incriminated Dreyfus, to be a forgery, but resigned his position rather than consent to a new trial of Dreyfus, in whose guilt he was a firm believer.

Cavaignac, Louis Eugène (1802-57), Fr. soldier and politician, b. Paris. He entered the army as an engineer in 1824; served in Morea and afterwards in Algeria, where he won great distinction. In 1848 the provisional gov. made him Governor-General of Algeria, but soon afterwards he was recalled to Paris as minister of war. He crushed the revolutionaries with considerable severity and was made president of the council. He was defeated as a candidate for the presidency of the rep. by Louis Napoleon and became a prominent member of the republican opposition, which led to his imprisonment at the *coup d'état* of 1851. On his release he retired into private life until his death.

Cavallion, Fr. tn in the dept of Vaucluse, on the Durance, 15 m. SE. of Avignon (q.v.). There is a fine church (12th-18th cent., formerly a cathedral), and a beautiful 18th-cent. synagogue. The tn is a market for fruit and vegetables, and has a silk trade. Pop. 13,800.

Cavalcanti, Bartolommeo (1503-62), Florentine noble and orator, who led a revolt against the Medici, and was afterwards employed by Pope Paul III.

Cavalcanti, Guido (c. 1250-1300), It. poet and philosopher. His father was one of those whom Dante mentions in the *Inferno* as condemned to torture among the Epicureans and atheists, but Guido himself was a friend of the great poet, who dedicated his *Vita Nuova* to him. By his marriage with Beatrice, daughter of Farinata Uberti, C. became head of the Ghibelline faction in Florence, and when the leaders of both Guelphs and Ghibellines were driven out by the people of Florence, he was banished to Sarzana and returned to Florence only to die. He wrote in prose on philosophy and oratory, but his most famous work is the 70-line metaphysical *Canzone d'Amore*, beginning 'Donna mi prega.' He wrote many

ballads, canzoni, and sonnets of great beauty, his favourite theme being the anguish of love, and this gives his poetry a tragic note. Most of his poems are addressed to a lady called Giovanna. C. is certainly one of the most striking poets of the 13th cent. The best ed. of his works is Ercole's *Guido Cavalcanti e le sue Rime*, 1885. See also D. G. Rossetti's rendering of sev. of his poems in *Dante and his Circle*, 1892, and J. E. Shaw, *Guido Cavalcanti's Theory of Love*, 1949.

Caviaselle, Giovanni Battista (1820-1897), It. author and art critic, b. Legnano. In 1846 he went to Germany, where he met J. A. Crowe (1825-96) (q.v.) and returned to Italy with him. In 1848 he was banished for his share in the It. revolution; he accompanied Crowe to London and collaborated with him in *Early Flemish Painters*, 1857. In 1858 he returned to Italy and pub. his *History of Painting in Italy*, 1864-71, and the lives of Titian, 1876, and Raphael, 1883, in all of which he was assisted by Crowe. In 1861 he became secretary to Giovanni Morelli (1816-91), the art critic and patriot (q.v.), then engaged as president of a commission appointed to bring all works of art, which could be considered public property, under gov. control. In 1878 he was appointed chief of the National Art Gallery at Rome. The great *History of Painting* was under revision by Crowe until his death in 1897, when it was continued by S. A. Strong (d. 1904) and Langton Douglas; vols. I and II appearing in 1903, and vol. III in 1909.

Cavaller, Jean (1679-1740), Camisard leader, b. Ribaute, the son of a peasant. In 1702, when the persecuted Protestants of the Cévennes rebelled against Louis XIV, C. became one of their outstanding leaders, and sev. times defeated the royal generals, finally obtaining excellent terms from Villars in 1704. He joined the Brit Army and fought at Almanza, 1707.

Cavaller (Low Lat. *caballus*, poor horse), originally a horseman, horse-soldier, hence knight, gallant. In Eng. hist. the name is familiar as that applied (firstly, c. 1641) to the adherents of the Stuarts in the struggle between Charles I and Parliament, their opponents being nicknamed Roundheads (q.v.). The name survived till the extinction of the C. (Parliament Exclusion) Bill, 1679, being then replaced by Tory (q.v.). The variant 'chevalier' was used as a title in certain orders of knighthood and was also a name particularly applied to the Young Pretender.

Cavalleri, Buonaventura (1598-1647), It. mathematician, b. Milan, devoted his life more especially to the study of geometry. From his youth upward he was the victim of a cruel disease, which his work helped him to forget. He became a Jesuit at an early age, and on the recommendation of the order he was made prof. of mathematics at Bologna in 1629. In his *Geometria indivisibilibus continuorum nova quadam ratione promota*, 1635, he expounded his celebrated 'theory of indivisibles,' which has been invaluable

in the determination of centres of gravity and volumes, and has contributed not a little to the development of the integral calculus. According to his conception all space may be regarded as made up of an infinite number of parts, which represent the limit of decomposition which the mind can imagine anything to undergo.

Cavaleri, Emilio de' (c. 1550-1602), It. composer, b. Rome, where he was organist at the Oratorio del Crocifisso in 1578-84. He then went to Florence and became a member of the group which aimed at the new monodic style. His most famous work is *La rappresentazione di Anima e di Corpo*, a kind of staged oratorio or mystery play with allegorical figures, from which a single step of development led to opera. It was produced at St Philip Neri's church in Rome in 1600.

Caavalla (Kavalla), tn and port in a gulf of the same name, in the dept of C., Gk Macedonia. Cap. of that dept and centre of a tobacco-growing dist. Mehemet Ali was born here. It was Turkish ter. until the Balkan war, 1912-13. C. has been identified with Neapolis (Acts xvi). Pop. (dept) 136,350; (tn) 42,100.

Cavalli, Francesco (1602-76), It. musical composer, b. Crema, his real name being Pier Francesco Caletti-Bruni. He took the name of C. from his patron, a nobleman at Venice, where he became a singer at St Mark's in 1617, rising eventually to be *maestro di cappella* (1668). He wrote over 40 operas, the most famous of which are *Giasoni (Jason)*, 1649, and *Il Ciro (Cyrus)*, 1654. On the occasion of the marriage of Louis XIV in 1660 C. was invited to France to produce his opera *Serse (Xerxes)* and 2 years later he returned to produce *Ercole amante (Hercules as Lover)*. C. therefore did something to acclimatise opera in France and his recitative won the admiration of Lully.

Cavallini, Pietro (c. 1250-c. 1330), It. painter, a fellow worker of Giotto at Rome. Like many of his contemporaries he was also a master of mosaic work, a sculptor, and an architect. His great 'Crucifixion' fresco at Assisi is still fairly well preserved, and recently some valuable paintings of his at the church of Santa Cecilia, in Rome, have come to light. It is said he helped Giotto in the mosaic of the Navicella at St Peter's (q.v.).

Cavallo, Tiberius (1749-1809), It. electrician, settled in England about 1771, and remained there for the rest of his life. He invented chemical apparatus and many extremely sensitive and accurate electrical instruments. In his *Treatise on the Nature and Properties of Air* he discussed Dr Priestley's recent discoveries, rejected the phlogiston hypothesis, and noted for the first time the nature of the influence of light and air on plant life. His *A Complete Treatise of Electricity*, 1777, proved him also to have been a natural philosopher of no mean order. He was elected a fellow of the Royal Society.

Cavallotti, Felice (1842-98), It. politician, poet, and dramatist, b. Milan. In 1860 he pub. a tract, *Germania e*

Italia, against foreign rule, and joined the Garibaldian forces, fighting with them again in 1866. In this year he became editor of the *Gazzetta Rosa*, and both there and in the *Gazzetta di Milano* wrote numerous bitter lampoons against the monarchical national gov., his policy being always democratic and radical. In 1872 he entered Parliament as deputy for Cortecolona, and in 1886 became leader of the party of the extreme left. He was a violent adversary of Crispi, and was famous for the frequent lawsuits and duels in which he was involved. He was killed in a duel with Count Marcola, editor of the *Gazzetta di Venezia*. He wrote some beautiful lyric poetry, including *Anticaglie*, 1879, and *Il Libro dei Versi*, 1898, and among his dramas are *Alcibiade*, *Messeni*, and *Cantico dei Cantici*. His works in 9 vols. were pub. at Milan in 1896.

Cavalry. The use of C. began with organised warfare itself, though not at once in all parts of the world. C. tactics developed initially upon the Asiatic plains, and cents. of tradition lay behind the Parthian horsemen who annihilated the legions of Crassus at Carrhae (53 bc). Philip of Macedon was the first W. ruler to discern the value of a mounted arm in support of heavy infantry. His son, Alexander the Great, was a brilliant C. commander, and C. proved decisive at the Granicus (334), Issus (333), Gaugamela (331), and the Hydaspes (327). Hannibal made equal use of C. at Trebia (218) and Cannae (216); nor did the legions (see ROMAN ARMY) establish their superiority and become almost invincible until they had learned how to employ C. as an auxiliary arm. The best of these troops were recruited in Gaul, Germany, and Spain; and Caesar's Ger. C. more than once saved a perilous if not desperate situation. By the 3rd cent. AD, however, the Rom. C., though greatly increased in numbers, had become separated from the infantry, and many historians consider this separation of the 2 arms as a prin. cause of the decline of Rome's military power. The empire was gradually overrun by barbarians, who relied almost exclusively on C. and for whom the imperial squadrons were no match. But from about the year 1000 C. resumed its importance in European warfare, not so much as an aid to swift manoeuvre as a weapon whose effectiveness was derived from its sheer weight.

In the age of chivalry we discover that a battle resolved itself very largely into a matter of C. charges. The knights in armour, mounted on great chargers which were themselves at a later date clad in armour, swept down upon the infantry and usually carried the position. This was more or less the state of affairs during the 15th cent., but the overthrow of the feudal C. had by then become largely a matter of time. The new tactics had shown that bowmen and infantry could disperse and rout a C. force. Thus at Stirling Bridge the 'schilttrouns' of Wallace, at Crécy the use of archers protected by stakes, and at Bannockburn

the tactics of Robert Bruce had broken the furious charges of feudal C. Other tactics would have to be adopted by the C. before they could again vaunt their superiority over the infantry. Further influences also were at work at this time. The introduction of gunpowder and the consequent use of fire-arms had led to many innovations in the art of war. The C. began to be armed with fire-arms in addition to the lance which they carried, and their greater speed and mobility gave them a great advantage over the foot soldier. For the next cent. a duel was waged between the C. and the infantry. First was invented some means of attack

exceedingly great advantage. The Ironsides of Cromwell showed their fearlessness and courage in the charges against the pikemen and musketeers. They had certain advantages over the C. of modern times, but on the whole their work was as dangerous as it was until comparatively recent times, and they proved themselves to be the most useful 'arm' that a general had. But again C. declined: during the wars of the early years of the 18th cent. they found insufficient employment, and during the Seven Years War they were found to be lacking in dash and ignorant of manoeuvring. Under Frederick the Great the Prussian C. again reached a



'THE CHARGE OF THE LIGHT BRIGADE AT BALACLAVA'
A painting by R. Caton Woodville.

Harris

to give the C. an advantage over the infantry, and in turn the infantry were equipped to overcome the new tactics of the C. By this time both were armed with fire-arms, and also the use of cannon had become common to both. The C. again triumphed, since their mobility gave them a great advantage. Again, the influence of the religious wars of the 17th cent. on C. cannot be overrated. It was essential that the C., having charged the enemy, should not go too far either in pursuit or in search of plunder. The battle of Lewes may be quoted as an example where the C., having overthrown the enemy, lost the day owing to too prolonged a pursuit. The mercenary soldiers had already shown their superiority to feudal levies, but they had also shown that they were not to be depended upon in the matter of a quick return to the battlefield. The C. of the Protestants in the Thirty Years War, however, showed that, actuated by the highest motives of patriotism, they could be used with

high standard, only to decline at the end of the Seven Years War. During the early stages of the revolutionary wars C. was practically non-existent. A species of mounted infantry was used, but this was mounted only for the advantages of mobility. Under Napoleon the work of the C. was revived, and the C. were used in combination with the artillery. The mass of infantry to be charged were first of all riddled by a heavy artillery fire, and then the C., which had been massed within easy striking distance, were launched against it, to continue and finish the work made easy by the disorder and confusion created by the fire of the artillery. During the campaigns of the 19th cent. the C. did not on the whole play an important part. Following immediately on the Napoleonic wars they were practically disbanded, although in the Crimean war the C. were conspicuous for their gallantry in the famous charge of the Light Brigade (q.v.).

During the latter part of the century

the question of substituting to a large degree mounted infantry was mooted, and the plan found strong advocates, for it was argued that the conditions of warfare had changed in such a degree that the use of C. in the sense that it was used by Napoleon was no longer possible or necessary. One of the principal advantages of mounted men is mobility, and a large number of supernumerary C. were, until the First World War, always necessary at the beginning of a campaign. It was always found to be easier to recruit efficient riflemen for mounted infantry than it was to recruit trained C. men. The S. African War of 1899-1902 again saw a great revival of C. owing to the ideal nature of the area of operations for their employment. On the Brit. side many yeomanry regiments were sent to the front and many C. units were raised in S. Africa. The Boer force was practically a mounted infantry army. Just before the First World War it was maintained by a large number of authorities that we had again reached a normal stage in the evolution of C., and that the concentrated fire of shrapnel and quick-firing guns would make it possible for the C. to support the work of the artillery and penetrate the masses of infantry confused by the artillery fire, i.e. that it was possible to return to the evolutions of Napoleon. In the First World War, however, C. played only a minor part on the W. front. At the outset they performed their traditional function of moving well in advance of the infantry as a protective screen and then drawing off to a flank as the opposing infantry drew towards each other. On the W. front, however, the early settling down to trench warfare precluded C. action in any form, but on the E. front all combatants were able to employ C. at all times. The best C. exploits of the war were those of the Brit. in Palestine and Mesopotamia. But C., as an effective arm, has all but ceased to be of importance in a 'major' war. The experience of the First World War showed that tanks and armoured cars, being far less vulnerable and far speedier, should take over some of the duties of reconnaissance, pursuit, and protection previously performed by C. C. played no part in the defeat of the Sp. Republicans by Franco (1936-9), the chief factor in his victory being the Ger. and It. air forces. Similarly, in Poland, the Ger. air-raids on that country ended the campaign in 3 weeks (1939), combined with attack by massed tanks and motorised units. There were C. units on the Polish side, but they may almost be said to have been reminiscent of the Middle Ages. In the Brit. service the C. estab. was greatly reduced in the first decade after the First World War, and later most C. regiments were converted into armoured car or light tank units (see also ARMY). Armoured cars have in recent years been found invaluable in such differing types of country as the plains of Iraq and the mts on the NW. frontier of India. A Brit. C. regiment was divided into 4 'squadrons,' each of which had 2

'troops.' In the field each brigade of C. was supported by a battery of horse artillery.

In the U.S.A. C. first came to the fore during the Civil war. It was efficient in all branches and adaptable to all circumstances. Sheridan's pursuit of Lee in 1865, Stuart's impenetrable screen in 1863-4, the C. battle of Brandy Station (9 June 1863), and Sheridan's destruction of Early's army in the Shenandoah were all first-class operations. The wide spaces of America provide a natural theatre for C. action which the C. was not slow to demonstrate in Indian wars.

It is often said that the experience of the First World War sounded the knell of C., and that the fundamental duties of C. can now be more efficiently performed by the aeroplane and the armoured fighting vehicle. On the W. front C. was of the first importance in the earliest phase when the opposing armies were as yet feeling their way. Afterwards, during the protracted period of position warfare, it could act only as infantry and as a mobile reserve. It is clear from a report of Sir Douglas (later F.-M. Earl) Haig to his gov. that during the period of infantry and artillery action the true function of the C. was to move on the flanks, and he makes the implicit admission that as there were no flanks, or, in other words, as the flanks rested on neutral states or impassable obstacles, that function was in abeyance. In the final period the C. were ready to revert to their historic role of pursuers, but by that time the morale of the Ger. armies was broken. Many of the foremost allied leaders testified to the great service performed by the C. in the early weeks of the operations on the W. front; Sir Douglas Haig stated that 'it has been proved that C., whether used for shock effect under suitable conditions, or as mobile infantry, have still an indispensable part to play in modern war.' Gen. Pershing observed that 'the splendid work of the C. in the first few weeks of the war more than justified its existence and the expense of its upkeep in the years preceding the war.' Gen. von Kluck, the commander of the First Ger. Army, lamenting his lack of C., stated that during the Brit. retreat of Aug. 1914, the chief factor that enabled the Brit. Army to escape was that his (von Kluck's) forces did not possess the effective means of compelling it to turn and resist, namely, the 3 divs. of Marwitz's C. (*Journal of the U.S. Cavalry Association*, April 1920). More favourable opportunities occurred in Palestine, where the Brit. yeomanry co-operated with the Australian and New Zealand mounted infantry. The former were, of course, armed like the regular Brit. C., but the dominion forces were armed with rifle and bayonet, and it was only later that the Australian Light Horse Div. was trained in the use of the sword, and that the dominion troops became gradually assimilated to C. proper. At the commencement of the operations in Palestine, the yeomanry attacked with the sword, advancing in the customary

double rank formation; whereas the dominion troops advanced at a rapid walking pace only, with rifle slung and bayonet held in the hand. The success of the attacks was due largely to the thorough preparation by machine-gun and field-gun fire. Later, under Gen. (later Lord) Allenby, the greatest C. leader of modern times, the C. reverted, with *éclat*, to their appropriate role of pursuer, and in this theatre of operations met with entire success. It is important to bear in mind that the Fr., Belgian, and Ger. military authorities, almost of necessity from the geographical position of their nations, considered a warfare of position as the most probable form for the next war in which their nations were likely to be concerned. In the training of Fr. C. the tactical principles on which emphasis is laid are rapidity, mobility, and ability to manoeuvre, always with a view to actual fighting on foot; and these tactics must conform to the modern development of fire power. In the frontal attack dismounted C. units should, according to the Fr. theory, act in co-operation with units armed with machine guns, the function of the whole force being to turn the enemy's flanks and to cover the advance of reserve units. As a result of the Russo-Jap. war, where the C. of both belligerents was so obviously inferior, continental opinion, especially that of the Ger. general staff, was that only a first-class and highly trained C. would be of any real use in a modern major war. Again, the view of the Ger. staff was that while charges by regiment and brigade were still feasible the charge by div. was a past chapter. They regarded the lance as superior to the sword, but argued that only shaken and surprised infantry were really vulnerable to C. attack. Finally, they held that C. must be able to fight mounted as well as dismounted, and not be relegated to the role of secondary infantry. The view of one school of Brit. thought after the First World War was that while C. had to some extent been superseded, as a primary factor of strategical reconnaissance, by the air arm, this supersession really operated to help the C., and permitted it to develop still more fully its capabilities in tactical reconnaissance—a function which the aeroplane could not perform at all. Modern Brit. cavalry experts were opposed to mixed brigades and favoured the adoption of divs. of 3 brigades of C. instead of 4, each brigade to consist of 3 regiments, so that the unit could be easily controlled by 1 leader, the regimental commander. Light guns, such as the 13-pounder rather than the 18-pounder, were considered the most suitable weapons for artillery of the C. div. of the future, the essential requirement being that the guns should keep up with the C. A proportion of howitzers should be added for the purpose of overwhelming enemy detachments which could not be reached by field guns of flat trajectory. Finally, each machine-gun squadron should carry no more than 12 guns, each squadron being organised into 3 troops

of 4 guns each. There was no finality in these views, which were essentially those of the traditional Brit. C. school. They favoured a C. div. exclusively composed of that arm, machine-gun units and other auxiliaries being under the control of the div.; while armoured-car units and motor machine-guns should not be included, but only attached as occasion might require. The extensive use of aerial reconnaissance in the Second World War largely discounted the view of the limitations of the air arm in that sphere noted above. C. played no part in the operations on the W. front in the Second World War, but it rendered considerable service on the E. front. Thus C. were combined with light mobile units in the operations of Marshal Rokossovsky against the Ger. Ninth Army in the summer offensive of 1944, and again in his operations to out-flank Minsk and Bobruisk in the same offensive. Russian C. were often used in great enveloping manoeuvres to cut off the retreat of Ger. forces in the Caucasus and other regions of the S. Russian front. For the hist. of individual C. regiments see DRAGOON; DRAGON GUARDS; HUSARS; LANCERS; LIFE GUARDS; YEOMANRY. See also Maj. M. W. Nicholson (U.S. Army), *Modern Cavalry*, 1922.

Cavan, Frederick Rudolph Lambart, 10th Earl of (1865–1946), soldier. He served in the S. African War 1899–1902 and was mentioned in dispatches. Commanded 1st Battalion Grenadier Guards 1908–12. Had retired before the First World War, but returned to active service, and commanded the Brigade of Guards, and later the Guards Div. and the 14th Army Corps. He was sent to Italy to take command of the Brit. troops in the operations on the Piave (1918). After the war, he was general officer commanding in chief, Aldershot, 1920–2, and chief of the Imperial General Staff, 1922–6; head of the War Office section of the Brit. delegation to the Washington Conference, 1921. Promoted general in 1921; field marshal 1932.

Cavan: 1. Co. of the Rep. of Ireland. Cavan is the co. tn; other tns in the co. are Cootehill, Belturbet, Kingscourt, Bailieborough, Ballyjamesduff, and Virginia. The Erne and the Woodford are the chief rvs., and the chief lakes are the labyrinthine Lough Oughter, and the beautiful Loughs Ramor, Sheelin, and Brackley. The Shannon, the longest riv. in the Brit. Is., rises in co. Cavan on the S. slopes of Cullinagh mt (2188 ft). Agriculture is the chief industry; potatoes and oats are the chief crops, and flax is also cultivated. Pop. 79,000 (90 per cent of the pop. is Catholic).

2. Mkrt tn on a trib. of the R. Annalee in the above co. The offices of the Dist. and Circuit Court and the Co. Council are in the Courthouse, and the offices of the Urb. Dist. Council are in the tn hall. By far the most conspicuous building in the tn is the splendid modern Romanesque Catholic cathedral (1942). Pop. 3500.

Cavatina, It. term applied in music to a simple melody, having no second nor a *da capo* part. It is also sometimes used

of any kind of light and smooth air, and frequently of those occurring in a grand scena. C. also denotes a piece of instrumental music, as for example in what is popularly known as Raff's C., the piece by which that composer is chiefly remembered.

Cave, Edward (1691-1754), printer, combined both at Norwich and London the functions of journalist and printer. In 1731 he founded, and for some years he ed., the *Gentleman's Magazine*, in which parl. debates were for the first time reported at some length. C. d. with his hand 'gently pressing' Samuel Johnson's. The latter had become his parl. reporter in 1740, and afterwards his friend.

Cave, George, 1st Earl (1856-1928), lawyer, b. London, second son of Thomas Cave, M.P. Educ. at Merchant Taylors' School, and at St John's College, Oxford. Called to the Bar 1880; took silk 1904, and enjoyed for many years a considerable Chancery practice. M.P., Kingston div. of Surrey, 1906-22. Solicitor-general in Coalition Gov. and knighted 1915. In 1916 he became home secretary; in 1919 a lord of appeal in ordinary. Lord chancellor in Bonar Law's ministry, 1922; he retained that office in Baldwin's till 1924. See Sir C. Mallet, *Lord Cave: a Memoir*, 1931.

Cave, William (1637-1713), divine, took his M.A. degree at St John's College, Cambridge, in 1680. He was vicar of Islington 1662-91; rector of All-Hallows the Great, Thames Street, 1679-89; vicar of Isleworth 1690. The 12 books he wrote on early church hist. were once standard works.

Cave Animals, term which is applied equally to animals whose remains have been found in a fossil state in caves and to living creatures which have adapted themselves to an existence in the dark and quiet shelter discovered by their ancestors. They are often distinguished from their kindred by the specific term *spelaeus* (Gk *spelaion*, a cave), e.g. the fossil hyaena and tiger are known as *Hyaena spelaeus* and *Felis spelaeus* respectively, while the living blind-fish is called *Amblyopsis spelaeus*. Their frequent lack of vision has also been obtained for many of them, as for deep-sea and underground dwellers, the prefix *Typhlo-* (Gk *typhlos*, blind), e.g. *Typhlichthys*, a genus of blind fishes. The chief characteristics of animals of this type are their reduced or absent eyes and consequent well-developed sense-organs, such as antennae and feelers, lack of colour, and their predaceous carnivorous habits occasioned by lack of vegetable matter in the darkened home. Among the gastropod molluscs sev. species of snails have been found in Austrian caves which have developed blindness as the result of their mode of life. Blind cave-dwellers are represented also in the Crustacea and Arachnida by sev. species, notably by *Cambarus stygius* and *Antrobia mammothia* respectively. In the orthopterous insects a genus of small cockroaches of a peculiar nature has been discovered in caves of the Philippine Is.; the females are devoid of sight and of all

power of flight. The Carabidae and Silphidae are well-known families of coleopterous insects which include sev. cave-dwellers, usually sightless, e.g. in the carabid genus *Anophthalmus* found in Europe and America, and the Amer. genus of Silphidae, *Adelops*. Rising higher in the animal world we come to the phylum Pisces, and here there are numerous fishes which shun the light and prefer a cavern for a home. The *Amblyopsis*, which occurs in the Mammoth Cave of Kentucky, is a colourless fish, about 5 in. in length, in which the eyes and optic nerve are imperfect; in the same family, i.e. Amblyopsidae, are found the *Cholopaster*, which has normal sight, and *Typhlichthys*, a blind and colourless fish whose home is near the Mississippi. A blind salamander, *Typhlotriton spelaeus*, inhabits the Rock House Cave in Missouri, and other cavernicolous amphibians are the *Typhlomolge rathburni* and *Proteus anguinus*, the olm, the latter being a native of Carniola. Its eyes are completely hidden, and when exposed to the light the colourless creature turns black. If such C. A. have lost their sight as a result of living for many generations in the dark they seem to provide evidence in favour of Lamarck's theory of inheritance of acquired characters. It is, however, possible to adopt the opposite view that the ancestors of these animals became blind as the result of a mutation (sport), and that they could then survive in dark places only, where functional eyes would in any case be useless.

Cave Art. The high importance of C. A. has become widely recognised in recent years largely through the work of the Abbé Breuil in S. France, N. Spain, and N. and S. Africa. This, the earliest known art of man, belongs to sev. of the cultures which go to make the Upper Palaeolithic stage of the Old Stone Age. The radio-carbon dates obtained suggest, with considerable reservations, an age of 20,000 years. The paintings and engravings are found on the roofs and walls of deep caves where no natural light penetrated; indications of torches, and cup-shaped lamps which provided artificial light have been seen. This art depicts animals in fresh and vigorous line which is often enriched with red and yellow ochre, red haematite, manganese and graphite, and sometimes emphasised by very finely powdered colour blown on through a pipe. The animals represented—bison, mammoth, horse, ox, red deer, and reindeer—are those known from datable deposits of their bones to be the food of Upper Palaeolithic man. The human form is depicted rarely, and then only as a sort of caricature or as a figure wearing a mask. These figures are apparently intended to represent hunters; their arrows point at the vital parts of the animals which are quite often shown to be in young. The art has an obvious magic purpose: to ensure fertility in the animals hunted as well as success in the hunt. The most famous cave is that at Lascaux (q.v.) near Montignac, which was discovered in 1940 by 4 boys. Another

well-known cave is Font de Gaume, Dordogne, where there is a remarkable series of bison in polychrome decoration. From the fact that one drawing sometimes overlies another, it is thought that the actual act of drawing and not the drawing itself was the essence of the magic. In the Trois Frères cave in the N. part of the central Pyrenees is a magnificent series of engravings made on the white surface of black rock; a yellow clay-like skin, due perhaps to weathering, is used to produce a cameo effect. A figure called 'The Sorcerer' in this cave has a human body with the head of a deer; it seems to represent the hunting spirit or god. In Spain there are sev. fine examples of C. A. in the prov. of Santander. The famous cave at Altamira, in which was found in 1879 the first known example of C. A. of this sort, has a series of polychrome paintings, particularly of bison, which are the finest of their kinds. No C. A. is known in Britain. See A. H. Brodrick, *Prehistoric Painting*, London, 1948; F. Windels, *Lascaux Cave Paintings*, London, 1949; H. Breuil, *Quatre cents siècles d'art pariétal*, 1952, with an Eng. trans. by Mary E. Boyle, 1952; G. Grigson, *The Painted Caves*, 1957.

Caveat, formal notice or caution given by a party interested, to a court judge, or public officer, against the performance of certain judicial or ministerial acts. In a more restricted sense a C. denotes (1) a caution entered in the Probate, Divorce, and Admiralty Div. to stop the granting of probates of wills or letters of administration; (2) a notice given to the bishop by a party who disputes a particular right of presentation to prevent the institution of a clerk to a benefice; and (3) a notice lodged at the patent office to prevent the registration of any invention under the patent laws.

Caveat Emptor (Lat. 'let the buyer be on his guard'), legal maxim which in the law relating to a contract for the sale of goods means that a purchaser must take all reasonable precautions in buying from another, for as regards the quality of a thing sold in the general circumstances of the sale he will not be allowed afterwards to repudiate the sale because he has not obtained all he wants. The Sale of Goods Act, 1893, has destroyed the maxim of some of its force by implying in every contract of sale conditions that the goods sold shall correspond to their description, that they shall be reasonably fit for the purpose for which the buyer wanted them, provided he made that purpose known to the seller, that the bulk shall correspond to the sample, and that the seller has a right to sell the goods; with the result that on the breach of any such condition the buyer can rescind the contract.

Cavedone, Jacopo (1577-1660). It. painter, b. Sassuolo, near Modena; studied under the Caracci and Guido, and was much influenced by Titian, whose works he studied at Venice. Most of his work was done for churches in Bologna, and is in both oil and fresco. His best work is 'The Virgin and Child in Glory,' 1614 (Academy of Bologna).

Cavell, Edith Louisa (1865-1915), nurse and patriot, b. Swardston, Norfolk, eldest daughter of the Rev. Frederick C. She was educ. at home, in Somerset, and in Brussels, and entered the London Hospital as a probationer in 1895. In 1906 she went to Brussels to assist in establishing a training school for nurses, and in 1907 was appointed first matron of Dr Depage's clinic, the Berkendael medical institute. On the outbreak of war in Aug. 1914 Dr Depage left to organise military hospitals, and Miss C. was left in charge of the institute, which became a Red Cross hospital for both Gers. and their enemies. On 5 Aug. 1915, Miss C. was arrested, charged with harbouring refugees and helping 130 of them to escape, and on 7 Oct. she was one of 36 brought to trial before a court-martial. Her Belgian defence counsel was not allowed to see her beforehand, nor to inspect documents, and the prosecution was helped by her own statement that she had received letters of thanks from the repatriated. She was condemned to death by shooting, the sentence being carried out at 2 a.m. on 12 Oct. despite the efforts of neutral diplomats to get the sentence commuted. On 15 May 1919 her body was buried at Norwich Cathedral. A memorial to her was erected in St Martin's Place, near Trafalgar Square, London, in 1920; her last words, 'Patriotism is not enough; I must have no hatred or bitterness towards anyone,' were added to the pedestal in 1924. See S. Kuschen (Miss C.'s defending counsel), *Devant les Conseils de Guerre allemands*, 1919; and A. Got, *The Case of Miss Cavell*, 1920.

Cavendish, surname of the ducal house of Devonshire (q.v.).

Cavendish, Lord Frederick Charles (1836-82), politician, second son of the 7th Duke of Devonshire, b. Eastbourne, and educ. at Trinity College, Cambridge. He was private secretary to Lord Granville, 1859; elected M.P. for Barrow-in-Furness, 1865; was Gladstone's private secretary, 1872; financial secretary to the Treasury, 1880. In 1882 he was chosen by Gladstone to succeed W. E. Forster as chief secretary to the lord-lieutenant of Ireland. On 6 May C. and the permanent under-secretary, Thomas Henry Burke (q.v.), were murdered in Phoenix Park by a gang of assassins, belonging to the secret society of Invincibles, in front of the viceregal lodge. James Carey, a member of the Dublin corporation, turned informer, 20 persons were arraigned, and 5 were executed and others sentenced to penal servitude. The assassins did not know who Lord Frederick was, but they meant to murder Burke. The murder had far-reaching political consequences for Ireland. Piggott's forged letter of C. S. Parnell condoned this murder.

Cavendish, George (1600-62?), historical writer, the eldest son of Thomas C., a clerk in the Exchequer. He became gentleman-usher to Cardinal Wolsey (q.v.), and served him faithfully to the end. After Wolsey's death he wrote his patron's biography, which was circulated

in MS., but not pub. in full until 1815. It is a valuable authentic record of the period.

Cavendish, Henry (1731-1810), natural philosopher, *b.* Nice, educ. at Cambridge. He was extremely shy and lived the life of a recluse. A millionaire and the possessor of a unique library, C. devoted his whole life to chemical and physical research, and found time also to work at mathematics and to read papers before the Royal Society. Not only did he discover the extreme lightness of hydrogen—which led at once to balloon experimenting, etc.—but before 1783 he had ascertained the constituents of water and atmospheric air, and had conducted his famous experiments on the density of the earth. Sir Humphry Davy spoke enthusiastically of the extreme accuracy of his work. See G. Wilson, *H. Cavendish*, 1851.

Cavendish, Thomas (1560-92), circumnavigator, commanded a ship in Sir Richard Grenville's expedition to Virginia (1585), and in the following year fitted out 3 small ships from Plymouth, in which he sailed round the world (1586-8) by way of the Magellan Straits, the E. Archipelago, and the Cape. During this voyage he discovered Port Desire, Patagonia, burnt 3 Sp. cities, and captured Sp. treasure. He *d.* at sea off Ascension, broken-hearted because his second expedition was not so successful as the first.

Cavendish, Sir William (c. 1505-57), Eng. courtier, founder of the family of C., *b.* Cavendish. He was the second son of Thomas C. of Cavendish, clerk of the pipe, and brother of George C. (q.v.). C. was treasurer of the royal chamber under Henry VIII, Edward VI, and Mary I, and was one of the commissioners appointed by Henry VIII to suppress the monasteries. He was 3 times married, his third wife being the Derbyshire heiress, Bess of Hardwick. With her money he planned the sumptuous mansion at Chatsworth, which his wife completed. See Kennet's, *Memoirs of the Cavendish Family*, 1737; J. Grove's *Lives of all the Earls and Dukes of Devonshire*, 1764.

Cavendish, William, 1st Duke of Newcastle (1592-1676), Royalist, educ. at St John's College, Cambridge. Charles I made him tutor to his son Charles in 1638. C. had previously entertained his sovereign at Welbeck, when Ben Jonson, whom he patronised, composed the masque. When the Civil War broke out C. sacrificed his own income to the Royalist cause. He won York for the Royalists by the victory of Adwalton Moor (1643). In the same year he captured Hull, but in the following, after the rout of Marston Moor, went abroad, where he lived in great poverty until the Restoration when he returned to England. Charles II created him Duke of Newcastle in 1665. C. wrote a number of dramatic works and plays. His second wife, Margaret (c. 1625-73), whom he married in 1645, and who had been one of Henrietta Maria's maids of honour, wrote a life of her

husband, 1667, which was extravagantly praised by Charles Lamb; and sev. poems.

Cavendish-Bentinck, see BENTINCK.

Caversham, Baron, see KNOLLYS, FRANCIS, 1ST VISCOUNT.

Caversham, part of the co. bor. of Reading since 1911. See READING.

Caves, or **Caverns** (Lat. *cavus*, hollow), hollow places formed in the earth or in rock. Most natural C. larger than mere slits or hollows below overhanging ledges have been produced by the action of water in one of 2 ways. The attack of the sea on the coast may form sea C.; the passage of underground water through soluble rocks such as limestones, chalk, or rock salt leads to the solution of rock to give an interconnecting network of subterranean passages and caverns. C. also form below glaciers where melt water carves subglacial waterways, and occasionally C. develop in volcanic areas where the central part of a lava flow has drained away leaving a lava tunnel formed by the rapidly cooled outer skin of the flow (see GLACIERS and LAVA).

Sea C. result from the attack of waves. The beating of waves and the pounding of shingle and boulders thrown up by the waves wear down the rocks unevenly. Where the rock is soft or cut by a plane of weakness such as a joint, fault, or bedding plane, erosion is more rapid. Once a small hollow has been formed a new factor becomes effective, as the air trapped in the hollow is compressed by the rising wave and allowed to expand when the wave retreats. The wedge-like action of the compressed air splits the rock and leads to the formation of a sea cave. The mouths of sea C. lie between tide marks. Old sea C. formed when the sea stood higher than at the present time may be seen on many coasts at the foot of abandoned sea-cliffs (see RAISED BEACHES). The shape of sea C. is usually controlled by planes of weakness in the rock. Blow-holes result when a cave opens out to the surface; air and water are ejected at suitable states of the tide, particularly when the sea is stormy. The force with which a plume of spray is thrown out of such holes illustrates the effectiveness with which air is compressed in the underlying cave by the advancing sea. The partial collapse of blow-holes produces the steeply inclined natural shafts known in the Channel Is. as *creux*. The collapse of the roofs of long sea C. gives rise to the narrow 'nests' called *grottoes* in Shetland. The largest C. known are those formed by the chemical rather than the mechanical action of water. These are the C. developed by the attack of underground water charged with carbonic acid derived either from the air or from decaying organic matter. Such water acts upon rocks, in particular upon the carbonates such as limestone or chalk, forming soluble salts which are carried away in solution, leaving cavities behind. Large subterranean galleries, caverns, and channels have been formed in various dists. by underground streams and rivs., particularly where calcareous rock is present. Whenever such a riv., or some natural cause, has abandoned

its subterranean water-course, the channel it has occupied gradually dries up, and tortuous underground passages remain, linking together the C. previously made by the water. The holes through which the rivs. have descended on their downward course below the earth are known as sink-holes. The direction of the caverns and channels can frequently be ascertained above ground by examination of these entrance-holes. Fine specimens of such sink-holes are found in Kentucky and Florida. In limestone dists. calcareous deposits are left on the walls of subterranean C. This is due to a double

finest specimens of such C. are to be found in Austria, whilst in England most beautiful specimens can be seen at Cheddar. One of the largest and most famous C. in the world is Mammoth Cave in Kentucky, U.S.A., situated some 85 m. S.W. of Louisville. It consists of a perfect maze of great chambers, grottoes, and domes linked by numerous passages and galleries. The extent is over 4 m., and it was evidently formed ages ago by the action of water in the prevailing limestone formation. The main cave is over 40 ft wide by 300 ft in length and about 125 ft high. One of the domes



INTERIOR OF A CAVE, SHOWING STALACTITES AND STALAGMITES

chemical process. First, the carbonic acid acts upon the calcium carbonate (or limestone), forming the soluble bicarbonate. When this solution is left standing on the walls of the cave the reverse process takes place, and glistening crystals of calcium carbonate remain. If water, laden with calcium bicarbonate, comes trickling through the roof of the cave, in the course of ages similar deposits are formed in the shape of icicles. These deposits slowly grow in size as the water drips from them, and where the solution falls on the floor of the cave dome-shaped mounds appear. The incrustations hanging from the roof are known as stalactites, and those on the floor stalagmites. Sometimes the stalactites and the stalagmites may become united, when it appears that the roof of the cave is supported by pillars. Sometimes these formations are of a pure dazzling white, but more often are coloured by some foreign matter in the water. When the cave is lit up artificially, the effect is extremely beautiful. Some of the

attains a height of 300 ft, and there are sev. others only slightly less in height. The presence of bones of humans, anthropoid apes, and of other animals together with artifacts preserved in C. demonstrates that these were inhabited and provides valuable evidence of life in past ages, of the evolution of man and of the way he lived. The preservation of such material and of cave paintings is often extraordinarily fine in consequence of the deposit of translucent calcium carbonate upon them. See also *ARCHAEOLOGY and CAVE ANIMALS*. Consult Sir W. B. Dawkins, *Cave Hunting: Researches on the Evidence of Caves respecting the Early Inhabitants of Europe*, 1874; Hovey, *Celebrated American Caverns*, 1882; A. Badin, *Grottes et cavernes*, 1886; E. A. Martel, *Les Abîmes*, 1886, *La Spéléologie au vingtième Siècle*, 1905-6, and *La France ignorée*, 1928; O. Pengelly, *Ken's Cavern*, 1894; F. Simony, *Die Höhlen im Dachstein*, 1913; N. Casteret, *Ten Years under the Earth*, 1939, *My Caves*, 1947,

and *Darkness under the Earth*, 1954; A. H. Brodrick, *Caves of Lascaux*, 1947.

Caves of a Thousand Buddhas (Ch'ien-to-tung), most famous repository of early Chinese painting, situated in the cliffs of a riv. valley, on the edge of a sandy desert, 25 m. from the small tn of Tun-huang, in NW. Kansu, 710 m. from Lanchow. They are really Buddhist shrines, over 400 in number, hollowed out of gravel rock. They vary greatly in size, the largest containing images of Buddha more than 100 ft high, the smallest being little more than niches in the wall. Although the earliest date from the middle of the 4th cent. AD, the majority belong to the T'ang (618-936) and Sung (960-1276) dynasties. The C. were dug out and painted by the monks and usually paid for by high officials and wealthy merchants, whose portraits and those of their families are often depicted along the walls. Many of the images have disappeared or been renovated, but the wall paintings, depicting secular and religious scenes, are still in a wonderful state of preservation, far better indeed than those at Ajanta (q.v.). For many cents. the C. were one of the greatest religious centres in all Asia, visited by monks from many countries. But in the 12th cent., probably owing to unsettled political conditions, they were sealed up with stone walls. First reported to the W. world in 1892 by an Englishman, Capt. Bower, the first serious work on them was done by Sir Aurel Stein (q.v.), who found in the long-buried library a treasure-house of early Buddhist and Asiatic literature, which has since yielded thousands of vols., many of the most important of which are now in the Brit. Museum. The C. are now converted into the Tun-huang Art Institute, and can be easily reached by the Lanchow-Sinkiang railway.

Cavetto, a hollow or concave moulding used in classical architecture.

Cavia, see CAVY.

Caviare, roe of the sturgeon prepared for eating. It is a favourite *hors-d'œuvre* or savoury. The variety known in Russia as *ikra*, which is loosely granulated and almost fluid, is the best. A coarser kind called *pafusnaval* is a common article of food in E. Europe. Hamlet's remark that 'His play . . . was caviare to the general' proves that it was a known delicacy in Shakespeare's day.

Cavitation, see SCREW-PROPELLER.

Cavite, cap. of the prov. of Cavite, Luzon, Philippine Is. Situated on Manila Bay, 10 m. from the city of Manila, it is a fortified seaport and until the Second World War was a naval station of the U.S.A. Since 1947 the U.S. has used the base only to a limited extent. It is an old tn containing narrow streets and buildings of stone with upper storeys of wood; it possesses 5 churches and a high school. It is the chief naval base of the Philippine Is., and during the 19th cent. was the scene of political troubles. An Amer. squadron under Commodore George Dewey wrested it from Spain in May 1898. Pop. of the prov. 262,550; tn

35,052. The chief products of the prov. are sugar, rice, and coco-nuts and other fruits. In the Second World War C. was captured by the Japanese on 3 Jan. 1942. Recaptured by Amer. forces on 13 Feb. 1945. See further under PACIFIC CAMPAIGNS, or FAR EASTERN FRONT, in SECOND WORLD WAR.

Cavity Resonator. Any hollow electrical conductor possesses distributed inductance and capacitance and can therefore act as an oscillatory circuit of definite resonance frequency. C. R.s are used as resonant circuits at very high frequencies corresponding to wave-lengths of the order of 10 cm. The resonant wave-length is proportional to the size of the C. R. and the wave-length can be altered by coupling with a reactance. The C. R. is simple in design, and has a high Q-factor. The shape may be spherical, cylindrical, or prismatic.

Cavour, Camillo Benso, Count (1810-1861), It. statesman, b. Turin, a younger son of an old aristocratic family of Piedmont. He was educ. at the Military Academy at Turin till 1826, when he obtained a commission in the engineers. During his leisure he studied Eng. politics, and developed his strong liberal views which caused him to be regarded with suspicion in official circles. In 1831 he resigned his commission and devoted himself to social problems, practical agriculture, and foreign travel. In 1847 he started at Turin a weekly newspaper, *Il Risorgimento*, for the purpose of spreading the ideas of constitutional reform. In Jan. 1848, the revolution in Sicily broke out, and C.'s speech on the constitutional questions had great influence, not only on the people, but also on the Piedmontese king, Charles Albert, who was induced to grant a constitution. After the Piedmontese defeats against Austria in the war 1848-9, C. threw himself still more ardently into his ideal of freedom from Austria and a united It. kingdom, realising, now, that the unification of Italy would require powerful foreign help; for Piedmont could never defeat Austria single-handed. His difficulties were immense, for he had, in addition to all the external force of Austria and the supporters of the dynasties in Tuscany, Naples, etc., to combat the traditional and separatist policies of Mazzini and the republicans and the danger of an anti-papal and anti-clerical movement, which he judged would destroy his own schemes of employing foreign help to unify his country. In 1850 he became minister of agriculture and commerce, and in 1851 of finance, but he resigned on a difference with the Prime Minister, d'Azeglio. He then travelled in France and England to discover the trend of foreign opinion in regard to the It. problem. In 1852 he returned and was appointed Prime Minister, a post which he filled, with short intervals, till his death. He now began his masterly scheme of foreign policy, which was to make a united Italy possible. He shrewdly placed Sardinia and Piedmont among the major powers by sending a well-disciplined force to the Crimea.

while Austria remained neutral. He secured the active friendship of France, and the benevolent neutrality of England, and in 1858 formed an alliance with Napoleon III, followed (1859) by a victorious joint campaign against Austria (Magenta and Solferino). The agreement of Villafranca, brought about by the sudden withdrawal of Napoleon, left Venetia in the hands of Austria, and bitterly disappointed C., who resigned, but later returned to office. He had ceded Nice, Garibaldi's bp., and Savoy to France in return for the alliance, for which he was violently upbraided by Garibaldi and his supporters. But the adhesion of the central states of Italy to Piedmont soon followed, and the defeat of the Neapolitan kingdom in Sicily and Naples by Garibaldi. Save for the question of Rome and the papal temporal power and Venetia, C.'s policy had succeeded entirely, and at his death, Victor Emmanuel II was king of practically all Italy. The regeneration of Italy had been his ideal, and he had worn himself out prematurely to achieve it. See Countess E. Martinengo Cesaresco, *Cavour*, 1898, and A. J. Whyte, *Early Life and Letters of Cavour, 1810-48*, 1925, and *Political Life and Letters of Cavour*, 1930.

Cavour, It. tn, in Piedmont (q.v.), 24 m. SW. of Turin (q.v.). It has an anct castle, and has marble and slate quarries. Pop. 7000.

Cavtat, see DUBROVNIK.

Cavy, or **Cavia**, family of rodents found in S. and Central America, to which the capybara or carpincho belongs. The C.s have rough hair, well-developed ears, no tail, reduced toes, 4 on the fore feet and 3 on the hind feet. The guinea-pig, *C. cobaya*, known to us as a domestic pet, is probably descended from *C. culveri*, the restless C., a species with greyish fur. The Patagonian C. is a large animal of the same family Caviidae, but its two species form the genus *Dolichotis*; it resembles somewhat a long-legged hare, and has the same number of toes as *Cavia*. See also GUINEA-PIG.

Cawdor, par. of Nairn, Scotland, 3½ m. SW. of Nairn. In the fine old medieval castle the murder of King Duncan is popularly supposed to have taken place, but it actually occurred sev. cents. before the castle was built. Pop. 800.

Cawley, William (1602-66), Eng. regicide. He founded St Bartholomew's Hospital, Chichester, 1626. C. was an active member of the Long Parliament and was one of Charles I's judges. He was excepted from pardon, 1660, and fled to Belgium, and then to Switzerland, his property being granted to James, Duke of York.

Cawnpore, see KANPUR.

Caxamarea, see CAJAMARCA.

Caxias, Luis Alves de Lima e Silva, Duke of (1803-80), Brazilian marshal and statesman. He brought peace to SW. Brazil at the beginning of the Empire, and won the decisive battle of Humaita in the Paraguayan War.

Caxias, tn of Maranhão, Brazil, formerly known as Aldeias Atlas, on R. Itapecuru, 180 m. SE. of Maranhão, with

which it has riv. connection. It has sugar refineries, cotton mills, and ships babaçu nuts. Pop. 7000.

Caxius do Sul, It. colony in Rio Grande do Sul, Brazil, 60 m. NW. of Porto Alegre, with vineyards and cattle. Pop. 32,200.

Caxton, William (1422?-91), first Eng. printer, b. Kent. In 1438 he was apprenticed to a rich silk mercer, and the latter dying in 1441, young C. was dispatched to Bruges to finish his term. Here he set up business for himself, and in 1465 and 1469 he was employed, as governor of the company of Merchant Adventurers, in negotiating commercial treaties with the Dukes of Burgundy. The second time his mission was quite successful, and about 1471 he entered the household of the Duchess Margaret, sister of Edward IV, and wife of Charles the Bold of Burgundy, as commercial adviser. There is some doubt as to where C. actually learnt the art of printing. Many—among them Wynkyn de Worde, his disciple—say it was at Cologne, between 1471 and 1474, in company with Colard Mansion, who was his partner at Bruges, where he printed his first book in 1474 or 1475. This was a trans. of a Fr. romance entitled *The Recuyell of the Histories of Troye*. In 1476 his second printed work (completed in 1474) appeared, *The Game and Playe of Chess*, another trans. At Michaelmas 1476 C. was installed at Westminster, and an indulgence, dated 13 Dec. 1476, is the earliest extant specimen of C.'s work. Lord Rivers's version of *The Dictes or Sayings of the Philosophers*, 1477, was the first book printed by C. in England. Thenceforward C. pub. some 80 books, many of them his own trans. of famous Fr. legends and cycles of romance. His *Myrrour of the World*, 1481, is the first vol. he issued with woodcut illustrations, whilst as many as 70 woodcuts were inserted in his ed. of the *Golden Legend*—his own compilation from a Fr. work of the 13th cent., containing lives of the saints. But by his fellow countrymen he will be remembered above all for his services in fixing the Eng. language, which was in a changing, somewhat chaotic condition, and in bringing the literary masterpieces within the reach of those who could read. Twice he printed Chaucer's *Canterbury Tales*, and he brought out also Gower's *Confessio Amantis*, 1483, and Malory's *Morte d'Arthur*.

Cayambe: 1. Extinct volcano of the Andes, in Ecuador, practically on the equator, 19,014 ft high.

2. Tn of Pichincha prov., Ecuador, at the foot of C. volcano, an agric. market. Pop. 7400.

Cayenne, old name for Fr. Guiana (q.v.).

Cayenne, city, Atlantic port, and the cap. of Fr. Guiana, at the mouth of the Cayenne R. on the NW. coast of the is. of that name. The harbour is shallow and ships of over 15-ft draught must anchor outside it. There is an international airport. The staple exports are gold, timber, rum, cocoa, hides, and spices. The penal settlement was

abolished in 1946. Malaria was virtually wiped out and full preventive control instituted in the early 1950's. Pop. 11,000.

Cayenne Pepper, see CAPSICUM.

Cayes, Les, or Aux Cayes, main seaport, cap. of Sud dept. on SW. coast of Haiti, 98 m. SW. of Port-au-Prince. It is an episcopal see and exports sugar, coffee, bananas, cotton, and logwood. Pop. 11,850.

Cayey, tn of E. central Puerto Rico, W. Indies, in the Central Cordillera 25 m. S. of San Juan. It is a summer resort, and the centre of a sugar, coffee, and tobacco dist. Pop. 18,429.

Cayley, Arthur (1821-95), mathematician, b. Richmond, Surrey. He was educ. at King's College, London, and Trinity College, Cambridge. Senior wrangler of his year, 1842, he was also winner of the Smith prize. He practised as a barrister for 14 years, and returned to Cambridge as Sadlerian prof. of pure mathematics. He produced a number of memoirs of outstanding importance, dealing with quantics, the theory of invariants, analytical geometry, matrices, and elliptic functions, which collected and pub. by the Cambridge Univ. Press, form a monument to his fame as one of the greatest of mathematicians. He possessed honorary degrees of almost every foreign univ., and was a fellow of the Royal Society. He d. at Cambridge, and his portrait and bust are in Trinity College.

Cayley, Sir George (1773-1857), Eng. inventor, now accepted as the true father of the modern aeroplane. He was the first to formulate the root problems of heavier-than-air flight, and the first to conduct basic scientific research from which the whole development of the aeroplane derives. His model glider of 1804 was the first proper historical aeroplane, and later he constructed and flew the first man-carrying glider (c. 1850). He pub. his researches on aviation and aerostation at various times and thus ensured that those who followed should build on the right foundations. He was also an able inventor in other fields, but his aeronautical work was outstanding. See AEROPLANE.

Caylus, Marie Marguerite Le Valois de Villette de Murcay, Comtesse de (1673-1729), Fr. noblewoman, b. Poitou, the granddaughter of Théodore Agrippa d'Aubigné. She was taken to Paris and educ. at court by her aunt, Mme de Maintenon, and in 1688 married the Comte de C., who d. in 1704. She won a great contemporary reputation as a beauty and wit, and left a book which was edited as *Souvenirs* by Voltaire in 1770.

Cayman, see CAIMAN.

Cayman Islands, 3 low-lying is. of the W. Indies, which were colonised by the Brit. from Jamaica, 140 m. to the NW., of which they still form a dependency. Columbus, who discovered them, named them *Tortugas* after the turtles which abound in the is., and which are even to-day the chief export, together with tortoise-shell and shark skins. The first account of the is. is the report of

the third voyage of Columbus on his return from Porto Bello to Hispaniola in 1493. Therein it is stated that the is. were covered with turtles, which swarmed also on the coasts in such multitudes as to look like ridges of rock. There is also an early description of Grand Cayman by Capt. Wm Jackson, who visited the is. in 1643 in an abortive attempt on Jamaica. He says: 'The island is much frequented by English, Dutch, and French ships, that come purposely to salt up ye flesh of these Tortoises.' In 1655, when Jamaica was taken, the C. I. became a regular source of food supply for the soldiers and fleets of England cruising the Caribbean. Coco-nuts are grown on Little Cayman and Cayman Brac. The is. are rich in timber, and their inhab. are clever shipwrights. Georgetown is the chief tn of Grand Cayman. The gov. is administered by a commissioner, assisted by a legislative assembly comprising justices of the peace and elected vestrymen; enactments require the assent of the Governor of Jamaica. The total pop. of the group is some 8000. No survey of the is. has yet been made, and the area of the group is variously estimated at 92 to 140 sq. m.

Cayor, dist. of Senegal, Fr. Equatorial Africa, until 1883 part of the kingdom of Djolof. It is now under the direct control of France, and is traversed by the railway from Dakar to St Louis. Pop. about 100,000.

Cayos, see TURKS AND CAICOS.

Cays (pronounced 'keys'), name given to the is. off the coast of Brit. Honduras. The prin. are Turneffe (a corruption of Terra Nova), St George's Cay, Eng. Cay, and Ambergris Cay. They are much resorted to for bathing and fishing, and there are sev. 'week-end' residences in St George's Cay. This latter was the H.Q. of the log-cutters, or bay-men as they were called. It was here that the bay-men and the Brit. sloop *Merlin* defeated a force of 2000 men under Gen. O'Neill, the Governor of Yucatan, in a battle on 10 Sept. 1798, the anniversary of which is still annually celebrated in the colony.

Caytoniales, fossil plants of Jurassic age found at Cayton Bay, Yorks. They were early flowering plants or sub-Angiosperms, but were still closely allied to the Pteridosperms.

Cayuga: 1. Co. of New York state, U.S.A., bounded on N. by Lake Ontario, and on W. by Lake C. It has deposits of salt, gypsum, and limestone. Area 722 sq. m.; pop. 70,135.

2. Lake of New York state, U.S.A., lying partly in Tompkins co., and forming the boundary between C. and Seneca cos. Longest (38 m.; average width, 4 m.) of the Finger Lakes. At the S. end lies Ithaca.

Cazalla de la Sierra, Sp. tn in the prov. of Sevilla, with Rom. and Moorish remains. Aniseed liqueur and cork are manuf. Pop. 5000.

Cazin, Jean Charles (1840-1901), Fr. painter, b. Samer, Pas-de-Calais, the son of F. J. C., a famous doctor; he studied in France and England, where he came into contact with the Pre-Raphaelites. In

1889 he was made an officer of the Legion of Honour. Though his earliest works are on religious subjects, he excelled in landscapes into which figures were introduced. Among his best pictures are 'The Flight into Egypt,' 1877, 'Hagar and Ishmael,' 1880, 'Souvenir de fête,' 1881, and 'Journée faite,' 1888.

Cazique, see CACIQUE.

Cazorla, Sp. tn in the prov. of Jaén, with an anct castle, and a trade in grain and oil. Pop. 7000.

Cea, see CEAS.

Ceada, see CHAD, ST.

Cean-Bermúdez, Juan Augustin (1749-1829), Sp. writer, b. Gijón in the Asturias. He studied architecture and drawing, but not apparently with any great success, and, having a small pension from the gov., he was enabled to devote himself entirely to his literary pursuits as the historian of Sp. art. His first pub. was the *Diccionario Histórico de los mas ilustres Profesores de las Bellas Artes en España* (6 vols, 8vo), 1800; and his others are *Descripción Artística de la Catedral de Sevilla*, 1804, *Descripción del Hospital del Sangre*, 1804, *Carta sobre el Estilo*, etc., de la *Escuela Sevillana*, 1806, *Diálogo sobre el Arte de Pintar*, 1819, and lastly the *Noticias de los Arquitectos y Arquitectura en España* (4 vols., 4to), 1829, a work founded upon materials collected by Eugenio Llaguno. He also pub. a memoir of his friend Jovellanos.

Ceanothus, genus of Rhamnaceae, of which the species, natives of America, are cultivated as ornamental shrubs. *C. Americanus*, red root or New Jersey tea, *C. azureus*, *C. x burseroides*, *C. dentatus*, and *C. rigidus* are esteemed for their beauty when in flower, being blue in colour.

Ceará, N. state of Brazil, bounded N. and E. by the Atlantic, Rio Grande do Norte, and Paraíba, S. by Pernambuco, and W. by Piauí; lying partly on the great Brazilian plateau, its formation is that of terraces cut up by water-courses and high hills (3000 ft); the climate is very hot and it is subject to severe and destructive droughts. On the higher ground cattle are raised and some horses. The chief products (grown by irrigation in the interior and along the coast) are cotton, sugar, and coffee; carnaúba and oilseeds are exported. The cap. is Fortaleza (q.v.). Area 59,168 sq. m.; pop. 2,735,700.

Cebadilla, **Sebadilla**, and **Sabadilla**, various Sp.-Mexican names applied to liliaceous plants containing veratrine. *Schoenocaulon officinale* is one of these plants and the alkaloid is derived from its dried fruits; *Helonias officinale* is another species, a native of N. America; *Veratrum album*, often known as white hellebore root, and *V. sabadilla* are gathered for the veratrine-yielding rhizomes. These hellebore alkaloids, of unknown constitution, but of considerable physiological activity, have not found much use in medicine. The alkaloid *veratrine* forms crystalline salts. *Protoveratrine* is very poisonous and causes violent sneezing. The other alkaloids, *proto-*

veratridine and *veratroidine*, are of little importance. See also VERATRINE and VERATRUM.

Cebes, a disciple of Socrates and one of the speakers in Plato's *Phaedo*. He has been credited with the authorship of a work entitled *Pinax* or *Tabula* which was popular in the Middle Ages and trans. into many languages, including Arabic. It professes to be an interpretation of an allegorical picture in a temple. Like *Pilgrim's Progress*, it represents the snares and temptations of this life, and concludes that the true end of learning is to mould character. Modern scholars, however, while agreeing that the work is inspired by Platonic theories, attribute it rather to C. of Cyzicus (late 2nd cent. AD) or to an otherwise unknown author of the 1st cent. There is a trans. by R. T. Clark, 1909.

Cebidae, large family of Primates which is divided into 4 sub-families, represented by the howling monkeys, sakis, teetees, and Capuchin monkeys. They inhabit trees of the Neotropical region and sev. fossil forms have been discovered.

Cebu, is. of Philippines; area 1702 sq. m. It is intersected by fine mt ranges. The chief products are sugar, copra, tobacco, and hemp. There is a flourishing export trade, and salt, pottery, and making of sacks are some of the most prosperous industries. Excellent mangoes abound, and good sponges are found off the coast. Coal and oil are found here. The is. continued, under the U.S.A., the prosperity it enjoyed under Sp. rule. The first Sp. settlement was in 1565. Pop. 947,309. The cap. tn, C., is situated on the E. coast, N. of the centre. It is a port of entry and a municipality; the port is well protected from storms. The streets are wide and well laid out, and good roads traverse the surrounding country. C. is an episcopal see, and the bishop's palace is famous for its internal decoration. The Augustinian church possesses the miraculous image of the Santo Niño. The leper hospital was removed in 1906 to the is. of Culion. The cathedral, finished in the 18th cent., contains a cross said to have been erected by Magellan, the great explorer, who was killed in the neighbouring is. of Mactan. Jap. forces landed on C. is. on 11 April 1942, but the Americans recaptured it in 1945. Pop. (tn) 167,503.

Cebus, genus of monkeys typical of the family Cebidae, which belongs to S. America. The species have a well-developed thumb, a hairy prehensile tail, and 36 teeth. They include the Capuchin monkeys (q.v.), and were at one time common in Britain as the companions of hurdy-gurdy players.

Ceccano, It. tn, in Lazio (q.v.), on the Sacco, 5 m. S. of Frosinone (q.v.). It was severely damaged during the Second World War. Pop. 12,000.

Cecchi, Antonio (1849-96), b. Pesaro in Italy. He was a great traveller and explorer, and took part in the Marquis Antinori's expedition to Abyssinia (1876), being responsible for their route from Zella to Shoa. Two years later he went

on an expedition to explore the Galla country, taking with him Chiarini, but they were captured and imprisoned. C. was set free in 1880, his companion having succumbed during the confinement. He was next sent on a mission to Massowah by the It. Gov. and succeeded in concluding a treaty of commerce with the Sultan of Zanzibar (1885), at the same time pursuing his explorations along the coast. He wrote sev. books of travel.

Cech, Svatopluk (1846–1908), b. Ostředec, in Bohemia, one of the best-known Czech poets. His poems, inspired by national enthusiasm, have appeared in collections, the first in 1874. The most notable are *Vaclav z Michalovic, Lesetinský Kovář* (The Smith of Lesetin), and *Básně otroka* (The Songs of a Slave). His best-known novels (notable for their satirical wit) are *Provdiký, Arabeský a Humoresky*, 1878–80, and *The Candidate for Immortality*, 1884.

Cechy, see **BOHEMIA**.

Cecidomyia, typical genus of the family of dipterous insects known as Cecidomyiidae, the species of which are characterised by being minute and fragile, with longish antennae furnished with whorls of hair. The larvae are small maggots which live on vegetable or animal substance, and frequently produce galls on plants. *C. destructor*, the Hessian fly of N. America, is well known as a destroyer of wheat; *C. tritici*, the wheat-fly, has a larva which feeds on the pollen of wheat and the ear consequently produces no grain; *C. salticina* is common in France on willows.

Cecil, Lord Edward Christian David (1902–), critic and biographer, a son of the 4th Marquis of Salisbury. Educ. at Oxford, in 1948 he became Goldsmith's prof. of Eng. literature there, and in 1949 was made a Companion of Honour. His works include *The Stricken Deer* (a life of Cowper), 1929, studies of Sir Walter Scott, 1933, and Jane Austen, 1935, and 3 vols. of criticism, *Early Victorian Novelists*, 1934, *Poets and Story Tellers*, 1949, and *The Fine Art of Reading and Other Literary Studies*, 1957. He has also written biographical studies of Melbourne, *The Young Melbourne*, 1954 (the early years), and *Lord M.*, 1954 (the later years).

Cecil, Henry, see **EXETER, PEERAGE OF**.

Cecil, Lord Hugh Richard Heathcote, see **QUICKSWOOD, 1st BARON**.

Cecil, James Edward Hubert Gascoyne and **Robert Arthur James Gascoyne**, see **SALISBURY, 4th and 5th MARQUESSSES OF**.

Cecil, John, sometimes called **Snowden** (1558–1626), priest and political agent, b. Worcester; educ. at Oxford, Rheims, and Rome, where he became secretary to Cardinal Allen. He later went to Spain, and was employed by Father Parsons in various missions between Spain and England. He was captured, and subsequently acted as a spy for Burghley and Sir Robert Cecil. He took a prominent part in the controversies between the secular Catholics and the Jesuits.

Cecil, Robert, Earl of Salisbury (c. 1563–1612), Eng. statesman, succeeded his father, Lord Burghley, as secretary of

state (1596). C. was always delicate, and was known as the 'crook-backed earl.' He was one of the commissioners who tried Essex for leaving Ireland without permission (1600). He became James I's chief adviser; though hard-working and a skilful administrator, he was not of his father's calibre and left little impression on the constitutional hist. of the time. James rewarded C., who had helped him to the crown, by the gift of an earldom, but wanting C.'s estate at Hatfield for himself, obliged him to take Hatfield in exchange. C. was the bulwark of Hatfield House.

Cecil, Thomas, see **EXETER, PEERAGE OF**.

Cecil, William, see **BURLEIGH, 1st BARON**.

Cecil of Chelwood, Edgar Algernon Robert, 1st Viscount (1864–), statesman, third son of the 3rd Marquess of Salisbury. Educ. at Eton, and at Oxford (Univ. College), where he was a prominent speaker at the Union. Called to the Bar in 1887, became Q.C. in 1899. He was Conservative M.P. for Marylebone, 1906, but resigned his candidature, 1910, on account of his opposition to Tariff Reform. He stood for Blackburn as a Unionist Free Trader, but was defeated. In 1911 (by-election) he was elected for the Hitchin div. of Herts. He held that seat until raised to the peerage. He was an early supporter of the women's suffrage movement.

He came into the Coalition Gov., formed during the First World War, in May 1915; being first of all under-secretary for foreign affairs, till 1916; minister of blockade till 1918; assistant secretary of state for foreign affairs, 1918. In 1919 he was in Paris as chairman of the Supreme Economic Council, and assisted in drafting the Covenant of the League of Nations (q.v.). In 1920 he attended the first Assembly of the League at Geneva, as representative of the Union of S. Africa. He became Lord Privy Seal in the Conservative Gov. of 1923, and was raised to the peerage in the same year. In the second Baldwin administration, formed Nov. 1924, he was chancellor of the Duchy of Lancaster; and he frequently represented Sir Austen Chamberlain on the Council of the League. He was prin. Brit. representative on the Disarmament Commission at Geneva in 1926–7; and in 1927 he resigned from the gov. to devote himself to the strengthening of the League. Awarded the Nobel peace prize for 1937. Pubs.: *A Great Experiment: an Autobiography*, 1941; *A Real Peace*, 1941; *All the Way* (autobiography), 1948.

Cecilia, St (2nd–3rd cent.), Rom. virgin and martyr, whose name occurs in the Canon of the Mass. Her relics, with those of Sts Valerian and Tiburtius, now rest beneath the high altar of Santa Caecilia in Trastevere at Rome. She is the patron of music and musicians, and has been made famous in Eng. literature by Chaucer's *Second Nonne's Tale* as well as by Dryden's celebrated *Ode*. Her feast is on 22 Nov.

Cecropia, genus of tropical Amer. trees, family Moraceae. The wood is very light, and ignites readily by friction; the fruit resembles a raspberry and has an agreeable flavour; the bark is fibrous. *C. peltata*, the trumpet-tree or snake-wood, is a native of W. Indies and S. America, and the stems are made into trumpets by the Indians. It is noted as an example of myrmecophily in which ants live in the hollow stems, obtain food from the tree, and guard it against the ravages of leaf-cutting ants.

Cecrops, legendary first King of Attica. He is supposed to have divided the country into 12 communities, to have instituted the laws of property and marriage, and to have abolished the sacrifice of blood. C. was the legendary giver of the olive-tree to Attica (see ATHENA). His tomb was in the Erechtheum.

Cedar, or **Cedrus**, genus of Coniferae which contains 3 species: *C. Libani*, *C. of Lebanon*, *C. atlantica*, the silver or Mt Atlas C. of Algeria, and *C. deodara*, the deodar fountain-tree of India. These species, which are probably only varieties of a former plant, agree in having a fragrant, durable, light red wood which is used in building and cabinet-making. They are evergreen shrubs with needle-shaped persistent leaves, have wide-spreading branches, thick trunks, and the seeds take 2 or 3 years to ripen. They are cultivated in Britain on account of their handsome appearance, and in India they are thought to be sacred, and are planted near temples. The resin which exudes from the trunks was formerly used in embalming, and an oil was prepared from it. The name of *C.* is given to about 50 other trees, especially to sev. of the genera *Cedrela*, *Chamaecyparis*, *Cupressus*, *Juniperus*, and *Thuja*. The bastard C. of Jamaica is *Guazuma tomentosa*, and the white-wood C. is *Tecoma leucocylon*. See FORESTRY; TIMBER; TREE.

Cedar-bird, or *Ampelis carolinensis*, passeriform bird common to N. America, and is closely related to the waxwing. It is a songless bird, gregarious in habit, swift of flight, and has a voracious appetite, feeding on berries, fruits, and insects. It is known also as the Amer. or Carolina waxwing.

Cedar Creek, riv. of N. Virginia, rising in Shenandoah co., and flowing NE. to enter the Shenandoah R. 3 m. E. of Strasburg. Near it the Confederates, under Early, were defeated by the Federals, under Sheridan, on 19 Oct. 1864.

Cedar Falls, city in Iowa, U.S.A., on the Cedar R., 93 m. W. of Dubuque. It manufactures farm equipment, pumps, automobile seat covers, and blankets, and is the seat of Iowa State Teachers' College. Pop. 14,300.

Cedar Gum, resin obtained from *Callitris arborescens* used in medicine and in making varnish. It has a fragrant odour, and in appearance is yellow and transparent.

Cedar Mountains, see CEDERBERG.

Cedar Oil, which is an essential oil frequently used in mounting sections, is

obtained from *Juniperus virginiana*. This tree, although known as the N. Amer. red-cedar or pencil-cedar, is not true cedar.

Cedar Rapids, city, cap. of Linn co., Iowa, U.S.A., on Cedar R., 63 m. SW. of Dubuque. It manufactures cereal and other food products, portable rock-crushing equipment, milling and dairy machinery, furnaces, steel office furniture, etc. It has an art association with gallery and is the seat of Coe College. Pop. 72,300.

Cedar Resin, name given to the exudation of cedar-trees and allied species of Pinaceae. It was at one time employed in embalming.

Cederberg, or **Cedar Mountains**, mt range in Clanwilliam co., Cape Prov., S. Africa, so called from the profusion with which it is covered by the native cedar (*Widdringtonia juniperoides*). Highest peak, Sneeuwkop, 6300 ft.

Cedrela, genus of tropical Meliaceae, many of the species of which yield a compact, scented, and beautifully veined timber. *C. toona*, the bastard cedar, toon, or cedar-wood of S. India, has a bark which is a powerful astringent. *C. australis* is the Australian red cedar, and *C. odorata*, the W. Indian cedar, is made into cigar-boxes.

Cedriret, or **Coerulignone**, volatile solid occurring in the form of dark blue needles when in the crystalline condition. It was discovered by Reichenbach, who obtained it from coal-tar products, and its chemical constitution is represented by the formula $C_{12}H_{10}O_6$. It is prepared in the pure condition from the distillation products of beechwood tar.

Cedron (*Simaba cedron*), small tree of the order Simarubaceae, indigenous to Columbia. Has a fruit like a plum, containing a seed like a large almond. It is a febrifuge and an antidote to snake-bite.

Cedrus, see CEDAR.

Cefalù, tn and bathing resort in Sicily (q.v.), on the N. coast, 37 m. ESE. of Palermo (q.v.). It stands by a high cliff, and has a fine Norman cathedral (partly 12th cent.). Traces remain of the anct Gk city of *Cephalepedium*. There are rich marble quarries near. Sardine fishing is an important industry. Pop. 11,800.

Cegléd (formerly *Czegled*), tn of Hungary, in Pest co., 45 m. SE. of Budapest (q.v.). It is a railway, agric., and market-gardening centre, with distilleries and flour and brick industries. Pop. 39,000.

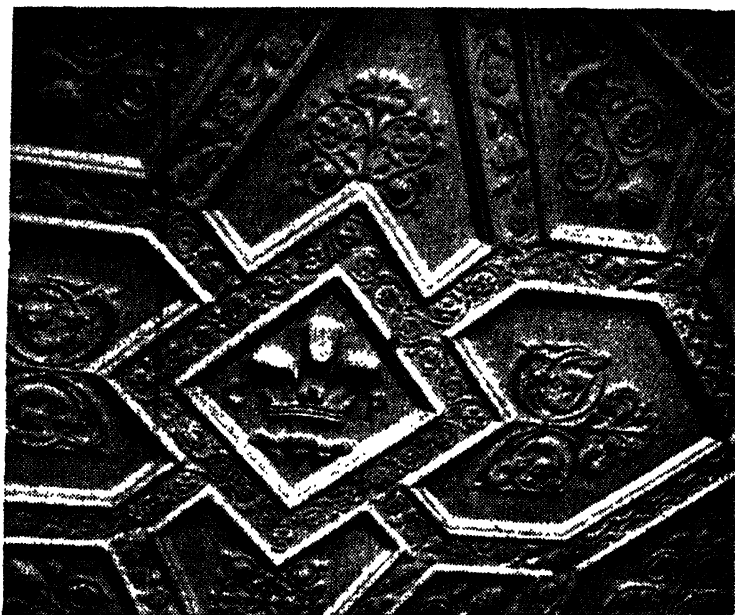
Ceglie Messapico, It. tn in Apulia (q.v.), 23 m. W. of Brindisi (q.v.). Pop. (com.) 18,000.

Cehegin (anct *Legisa*), Sp. tn in the prov. of Murcia. It manufactures paper, and has a trade in cereals, wine, hemp, honey, and esparto. There are rich quarries of black marble near by. Pop. 15,800.

Ceiling, the upper interior covering of a room, hall, church, or other building. The derivation has been much disputed. Lat. *celare*, to carve; *celare*, to hide, have been suggested, but the most probable source is Fr. *ciel*; Lat. *caelum*, sky. The term C. should not be confused with roof, the C. being 'the undercovering of a roof or floor concealing the timbers' (Murray,

New English Dictionary); thus such magnificent timber work as may be seen in Westminster Hall or Middle Temple Hall or the stone vaulting of cathedrals, etc., should not be treated as C.s. In the 14th cent. the construction of C.s proper developed, so that what was merely the underside of the floor above became an ornamental feature of the room below. Fr. and It. C.s of the 16th cent. were moulded in plaster, gilded, and painted.

lating a number of Russian national songs into the 'kindred Bohemian.' Deprived of his editorship of the leading newspaper of Prague, and of his professorship at the univ. because of his criticism of the severity of Emperor Nicholas in quelling the Polish insurrections, he accepted a professorship at Breslau in 1842, and in 1849 returned to Prague to die, his calamities having embittered and warped his nature. His *Ruze stolistá* (hundred-



National Building Record

PLASTERWORK CEILING AT TOTNES, DEVON

In 1520 Raphael executed for the Vatican a reproduction of a C. from the Golden House of Nero, and classical mouldings have been a favourite source of decorative design among architects, notably to the brothers Adam at the close of the 18th cent. The wooden C. of St Albans Cathedral is one of the earliest examples of the class in England. Among other fine examples are the It. C. at Holyrood, and those at Haddon Hall; Sizergh Hall, Westmorland; the Red Lodge, Bristol; houses in Fore St., Totnes, etc.

Čelakovský, František Ladislav (1799-1852), Czech poet and philologist, early became a passionate enthusiast for Slavonic language and literature. His *Slovanské národní písní*, 1812-27, was a collection of Slavonic national songs, and he wrote a book on *The Philosophy of the Slavonic Nation in Proverbs*, besides trans-

lated a number of Russian national songs into the 'kindred Bohemian.'

Celandine, name from Gk *khelidón*, 'the swallow,' applied to sev. plants. *Borconia frutescens*, the Tree C., a shrub of Mexico. W. Indies; *Cheledonium majus*, the Greater C. or Swallow-wort, a perennial herb of Europe, including Britain, and W. Asia; and *Stylophorum diphyllum*, the C. Poppy, a perennial herb of E. N. America belong to the Papaveraceae; while *Ranunculus ficaria*, the Lesser C., a perennial herb with bright golden yellow, buttercup like flowers, native to Europe and W. Asia, is common in woods, meadows, grassy banks, and stream sides in spring throughout Britain.

Celanese, see RAYON.

Celano, Thomas of (fl. 1250), poet, belonged to the order of Friars Minor. He wrote the words of the long 13th-cent.

hymn or sequence *Dies irae, dies illa* which is interpolated into the *Requiem* or *Mass for the Dead*. The opening of the traditional plainsong setting adapted to the words has been quoted by many composers in works where death is alluded to, including Berlioz, Liszt, Saint-Saëns, and Vaughan Williams. C. wrote biographies of St Francis and St Clara. See also *DIES IRAE*.

Celano, Lake of, see FUCINO, LAKE OF.



LESSER CELANDINE

Celastraceae, family of dicotyledonous plants, containing about 40 genera, in tropical and temperate countries. The species are trees or shrubs, with simple, stipulate, often leathery leaves, and small, usually hermaphrodite flowers. The calyx consists of 4 or 5 free or united sepals, the corolla of 4 or 5 petals, the stamens, 4 or 5 in number, and the carpels, 2 to 5 in number, are inserted on a flattened disk. There are usually 2 ovules in each loculus of the ovary, and the seeds have usually a bright aril; the fruit varies. The chief genera are *Catha*, *Celastrus*, *Elaeodendron*, *Euonymus*, *Pachystima*, *Schaefferia*, and *Tripterigium*.

Celaya, city on the Rio Laja, 29 m. W. of Querétaro, in the state of Guanajuato, Mexico. It was a main centre of the war of independence, 1810. There are famous colonial churches by the architect Francisco de Tresguerras (b. there, 1765). Its elevation is 5764 ft., and its industries include textile and flour milling, tanning, and distilling. Pop. 22,800.

Celbridge, small tn on the R. Liffey, 12 m. W. of Dublin, in the NE. of co. Kildare, Rep. of Ireland, home of Swift's 'Vanessa.' Pop. 800.

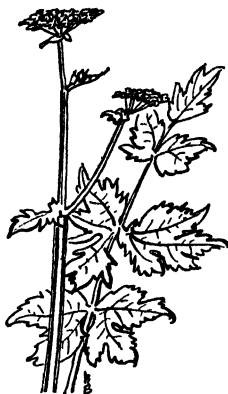
Celebes, is. in the Greater Sunda, Indonesia, between the C. Sea (N.) and the Flores Sea (S.). Curiously shaped, it consists of 4 peninsulas running E. and S. and separated by the Gulfs of Tomini, Tolo, and Bone. The mountainous interior rises to 11,286 ft at Mt Rantemario. In the centre are large high-level lakes, Poso and Towuti. Dense forests produce oak, teak, cedar, sandalwood, bamboo, and upas. Agric. products are copra, coffee, sago, and hemp. Mineral

resources include gold, silver, diamonds, coal, sulphur, nickel, and iron. Cattle and ponies are raised in the highlands. Trepan and mother-of-pearl fishing is carried on. The chief tns are Macassar, Manado, and Gorontalo. Pop. about 4,000,000, mainly Malay and semi-civilised Alfuros in the interior. The Portuguese settled C. in the Macassar area, 1625, but were driven out by the Dutch in 1660. Occupied by the Japanese in the Second World War, C. became part of Indonesia in 1950.

Celebes Sea, arm of the Pacific Ocean, surrounded by the Sula Is. and Mindanao on the N., Celebes on the S., and Borneo on the W.

Celeriac, see CELERY.

Celery, or *Apium graveolens*, a European species of Umbelliferae found wild in the marshes of England near the sea. In its wild state the plant is poisonous, but when cultivated the blanched leaf-stalks are valuable as purifiers of the blood, and may be eaten raw, stewed as a vegetable, or made into soup. The form known as celeriac, grown on the Continent, is turnip-rooted, and is used chiefly in made dishes or in sauces. In the cultivation of C. the plants are raised from seeds sown in a light, rich, well-drained soil from the end of Mar. to the beginning of May. When they are a few inches high they are transplanted into another bed until they attain a height of 6 or 7 in., and then placed in a row in a trench and gradually earthed



CELERY

up to blanch the stalks. The soil in this case should be moist, very rich, well fertilised, and well drained, as the goodness of the C. is dependent on its rapid growth.

Céleste, Madame (1815-82), Fr. dancer and actress, b. Paris. As a child she learnt dancing at the opera ballet, and when only 15 was offered an engagement in New York, where she made her first appearance at the Bowery Theatre. She

then came to England and played Fenella in *Masaniello* at Liverpool and in London, 1831. In 1834 she returned to the U.S.A., where she created a great sensation; according to the story President Jackson introduced her to his Cabinet. She returned to London in 1837, gave up dancing, and appeared at Drury Lane. Her best part was Miami in *Green Bushes* by Buckstone. She was manageress of the Adelphi Theatre with B. Webster, and subsequently of the Lyceum. She retired in 1870 and *d.* in Paris.

Celesti, Andrea (1637-1706), painter of the Venetian school, *b.* and *d.* Venice. C.'s works are very attractive, especially in colouring, in which he resembles Paul Veronese. He painted landscape, hist., sacred and profane, and *genre*; cabinet pictures, gallery pictures, and altarpieces. Five of his best pictures are in the gallery of Dresden, one of which is the sack of a city by night, the largest picture in the collection.

Celestial Globe, *see* GLOBES.

'Celestina, La.' Sp. novel, pub. anonymously in 1499 at Burgos, under the title *Comedia de Calisto y Melibea*, but generally called *La Celestina* from its prin. character. It was written in dialogue form, divided into 16 acts (5 more were added later). It is highly probable that the author was a certain Jew, Fernando de Rojas. Although certain resemblances may be traced between the characters and those in the work of Juan Ruiz, an earlier writer (q.v.), *La Celestina* owes its success not to its simple plot, but to its intense tragic power and magnificent characterisation, especially of *La Celestina*. The work may be called the first European novel. It was soon trans. into French, Italian, Latin, and English by J. Mabbé in 1631.

Celestine, name of 5 popes. C. I (422-432) had a peaceful rule. He was the first to take an active interest in the churches of Britain and Ireland. C. II (1143-4) removed the interdiction which his predecessor had put upon King Louis VII of France. C. III (1191-8) was elected at the age of 85. He crowned Henry VI Emperor of Germany, but failed to appease his hostility to the Holy See. The matrimonial irregularities of Philip Augustus of France and Alfonso IX of Leon involved him in disputes with those monarchs. Pope C. IV *d.* before consecration (1241). The fifth and last pope of the name resigned the chair of St Peter after 5 months (1294), and for this great refusal figures in Dante's *Inferno*. He was canonised in 1313. *See also* CELESTINES.

Celestine, or **Celestite**, mineral consisting of strontium sulphate, SrSO_4 . It occurs as large, well-developed, orthorhombic crystals and as fibrous, amorphous masses; it frequently has a light blue colour, whence the name C. The crystals are isomorphous with barytes, but are not so abundant; they possess a hardness of 3 and a sp. gr. of 3.9. Both forms are found in Triassic rocks; near Bristol the strontium forming part of the mineral has been taken up by plants; in Glos. the

mineral is put to industrial uses. Other localities are Sicily (a colourless variety), Hungary, Jena (fibrous), Strontian Is. in Lake Erie, and Frankstown, Pennsylvania (fibrous). It is also a constituent of some mineral waters. Celestite is used in the manuf. of other compounds of strontium, such as the hydrate, which is employed in the refining of beet sugar, and the nitrate, which produces the 'red fire' used in theatres and pyrotechnic displays.

Celestines, religious order founded about 1256 by Peter di Morrone, afterwards Pope Celestine V. Though the C. are counted a branch of the Benedictines, their form of gov. was much more akin to that of such mendicant orders as the Franciscans. Peter tried with ill success to persuade both the Benedictine monks of Monte Cassino and the Franciscan spirituals to coalesce with his brotherhood. At one time there were many Celestine monasteries in Italy, France, and the Netherlands, but the order is now practically extinct.

Celeus, King of Eleusis in Attica, where he entertained Demeter in search of her daughter Persephone. The goddess, in return, wished to make his son Demophoön immortal by placing him in a fire; but the child's mother, Metanira, coming upon the scene, cried out. Demophoön perished in the flames. C. is described as the first priest of Demeter at Eleusis.

Celibacy now generally implies complete abstinence from marriage (Lat. *caelebs*, unmarried), but formerly widows and widowers were also considered celibate. From the point of view of the State, widespread habits of permanent C., or of delay in marriage to late in life, must be disastrous, and C. has been frequently discouraged by legislation. In AD 9 (*Lex Julia et Papia Poppaea*) Augustus limited celibates in their rights of inheritance, and preference was given to candidates for office according to the number of their children. Taxation of bachelors has at times been enforced, and still more often proposed. It is, however, the enforcement of C. upon the clergy, or upon the adherents of particular religions, or upon special classes of those adherents, that makes C. of particular historic interest. To trace that hist. throughout the ages would be to write the hist. of asceticism; it must suffice to call attention to the self-castrated priests of Cybele, the *Galli*, to the Rom. vestal virgins, and to the C. of the anct Buddhist monasteries, and then to confine this article to the C. of the secular clergy in the Christian Church. The C. of the monastic orders is a matter of vow on entering the order. Heb. religion made the priesthood hereditary from father to son, and the C. of the Essenes sect may have been a foreign idea derived from Hellenism and the E. mystics. St Paul asserts that a missionary can work more freely without the burden of a wife and children, but reserves for the apostles the right to take a wife with them in their journeys. It has been freely admitted since the Renaissance by Catholic

scholars that C. was no rule of the apostolic church. Clerical C. can be traced first as a custom rather than as a discipline. The first clear rules are of the 4th cent., when bishops and priests were not allowed to marry, but might retain their wives if married before ordination. This is still the rule in the Orthodox Church of the E., where the unmarried, however, have all to be monks and provide all the bishops. The lesser orders, deacons, etc., might marry once only, and the wife must not be a widow or have been a concubine. Gradually, as the clergy became administrators of rich endowments, the feeling grew that church revenues must be kept for the church, not be used to support the families of priests, and more stringent rules were put in force. The local Synod of Elvira, AD 305, was the first to ban the marriage of the higher clergy; at the council of Nicaea, 325, a law to enforce C. on all the clergy was rejected. Paphnutius, a bishop of Egypt, warned the council against imposing so heavy a yoke, and defended the sanctity of marriage. The decretal of Pope Siricius, 385, imposed C. on bishops, priests, and deacons, and ordered the separation from their wives of those already married. Leo I (461) and Gregory the Great (604) extended the rule to subdeacons. The enforcement of C. was constantly resisted, and frequently disobeyed. Marriage of priests was still recognised sporadically, and the practice of having *subintroductae*, or uncanonical 'wives', was often tolerated. Gregory VII (Hildebrand), 1073, took such strong measures that he is often regarded as the author of the rule. Marriages of priests were declared null and void, the wives were treated as concubines, and heavy punishments inflicted on them; no priest who broke the rule could celebrate mass, and the laity were warned against going to such priests. The rule was not submitted to without a long struggle. In 1450 John de la Bere, Bishop of St David's, refused to enforce it among his clergy, as he derived 400 marks yearly from their women. Similarly in England: the Council of Winchester, 1076, and the far stricter Synod of Westminster under St Anselm, unsuccessfully legislated for clerical C., and in 1107 Paschal II in a letter to St Anselm dispensed the rule. In 1129 a Synod of London left it to Henry I to enforce, and he increased his revenues by tolerating clerical wives on payment of a fine. Repeated legislation shows that irregular, i.e. uncanonical, clerical marriage persisted and was common in England up to the time of the Reformation (cf. Henry VIII's proclamation against it in 1521). It was a subject of violent dispute at the Reformation, and became a marked difference between the Rom. and the Reformed Churches. At the revolution in France, by the constitution of 1791, all restrictions on the marriage of priests were abolished, but few took advantage of it.

Celje (Rom. *Claudia Celea*; It. *Cilli*), tn in Slovenia, Yugoslavia, on the Savinja.

It has remains of anct walls and towers, and is a centre for agric. produce. Pop. 22,000.

Cell, in biology, the living unit of which, according to the generalisation first propounded by Schleiden and Schwann (1838) all living forms are composed. The similarity of plan of this unit extends throughout all but the lowest forms of life, and may be extended by accepted definition to include bacteria and perhaps even spirochaetes, etc., but not the controversial viruses. The plant C. consists of a microscopic mass of protoplasm, usually enclosed within a wall of a carbohydrate called cellulose. The animal C. usually possesses no mechanically restricting wall, though its surface has very special properties and structure; it is often capable of considerable changes in shape. The study of cells is *cytology*.

Some animals and plants consist of one C. only: the Protozoa among animals, and the bacteria. All higher forms are multicellular, though even where repeated reproduction by building has occurred, they can almost unexceptionably be traced back to a single C.—the fertilised egg. The living C. unit is capable of metabolism (q.v.), of growth, and, at least in its early life, of multiplication by div. (see *Differentiation* below). There is thus a complete continuity in life, for every C. owes its existence to a previous C., and thus theoretically all C.s could be traced back to a primordial C. But it is inconceivable that such a complex structure as a C. should come into existence *ab initio*, and possible that, in the series of chemical equilibria of complex compounds which may have existed before life with a cellular organisation, many C.s would have come into existence, as a process of encapsulating portions of a medium with self-reproducing properties. For further hypotheses on the origin of life see *BIOLOGY*.

Structure. To say that all C.s consist of protoplasm—a term first applied by von Mohl (1846) to plant C.s, and subsequently to animal C.s also—implies little beyond a recognition that the common ground base of living material is an unbelievably complex association of organic compounds, containing the elements carbon, hydrogen, oxygen, nitrogen, phosphorus, sulphur, calcium, iron, sodium, magnesium, potassium, and chlorine, in reasonable quantities, together with traces of a great many others. Microscopic study reveals structures within the cell of varying size and shape, down to particles which cannot be resolved, even under the highest magnifications. The electron microscope indicates that the smaller particles are often individual molecules of appreciable size; the suspension of micro-particles in an aqueous medium is a physico-chemical condition known as a colloid (q.v.). Despite much recent work, it may well be that differences in opinion on the nature of protoplasm may largely be explained by the different appearances presented by colloids under the various techniques of observation; colloidal materials like this are extremely sensitive to changes in

temp., acidity, and foreign chemical compounds, which not only goes far to explain the sensitivity of living materials to such environmental constituents, but also points to the extreme dangers of interpreting the structure of living C.s from the appearance of dead ones, even taking into account the method of killing.

The protoplasm of most C.s is grossly divided into an outer, clearer region—the *cytoplasm*—and an inner, smaller, and more dense body—the *nucleus*. Appreciations of the physico-chemical properties of these regions by simple techniques, to measure things like acidity, viscosity, etc., are no real guide to the actual conditions under which the multitude of chemical reactions of life occur. It is considered that these generally take place at the surface of the many large and small inclusions in the protoplasm where conditions locally are very different. The cytoplasm usually contains food and waste particles (often called *metaplasm*), but there are other, more permanent and typical bodies. Chief among these are the *mitochondria* and the *Golgi apparatus*, both of which are regarded as essential to the C.'s secretory and metabolic activities. More temporarily there may also be 'spaces' called *vacuoles*, which are typical of growing C.s, but may also contain secretions, prior to discharge, or, especially in single-celled animals, contractile vacuoles, which serve to pump out excess water and excretory products.

The C. surface is of particular interest, since through it all materials for anabolism (q.v.) and much of the waste products of living activity must eventually pass. This is also true of all secretions, food products, etc., whose eventual destination is in other C.s, but which specialised C.s produce or modify. While to a large extent the substances transmitted by the surface of plant C.s are simpler, all C.s appear to have the special property of selective absorption, i.e. of transporting into the C. particular components of the surrounding medium, regardless of their relative concentrations outside and inside. Energy is expended in this process of *active transport*, which comprises one of the most fundamental problems in biological research.

The nucleus has a definite membrane, and its fluid contents are somewhat different to those of the cytoplasm. There are large numbers of granules of *chromatin*, so called because of its great capacity for absorbing certain stains. This material is often apparently irregularly scattered on a fine network—the *reticulum*—or forming small accumulations—the *karyosomes*. There are also often larger masses of chromatin, called *nucleoli*. The amounts of chromatin vary with the activity, particularly the secretory activity, of the individual C. The nucleus also contains the *chromosomes* (q.v.) on which are arranged the *genes* (q.v.) or individual characters of inheritance. Until very recently chromosomes had only been observable during actual C. divs., but they are now known to retain their individuality at all

other times, even if their shape changes somewhat. Chromosomes and chromatin are thought to be largely composed of *nucleic acids*, which are very complex organic compounds of characteristic type, and which belong to a class of substances that are most essential to life.

The nucleus is essential to the life, activity, and eventual survival of the C. It is intimately associated with heredity, growth, and C. div., and seems little modified in comparison with the diversity of form presented by the cytoplasm of C.s modified for special functions. C.s deprived of their nuclei may live at most for a few days, except for the red blood C.s (corpuscles) of mammals which are unique, even amongst the vertebrates, in being without nuclei when mature; perhaps consequently they live for a few weeks only, and are constantly replaced. In animal C.s, and in some plant C.s, a small granule, the *centrosome*, plays an important role in the div. of the C. It may lie either in a clear region near the nucleus, or actually inside it.

Differentiation. An animal or plant which consists of one C. carries out all the typical life processes—growth, digestion, excretion, reproduction, and often movement—within that one C.; it may even show more complex behaviour in capturing food particles, or swim by means of minute lashing filaments called *cilia* or *flagella*. This type of organisation is called acellular, or non-cellular, in contrast to the organisms of many C.s which are called multicellular. Except in the lowest multicellular forms, different parts of the organism are specialised for particular functions; there is a div. of labour amongst the C.s, and likewise a very delicately balanced system of co-ordination between them to achieve the overall functioning of the organism. The fertilised egg C. and the C.s derived from it by repeated div., present a generalised form even though their eventual tasks may be completely determined. But during embryology they *differentiate* into the many types of C., typical of their special roles, some developing contractile fibres and becoming muscle, elongating into nerve fibres, secretory gland C.s, and so on. The relation of these specialised forms to their function is included in *histology* (q.v.). For a description of particular cells see *MUSCLE* and *NERVE*.

Organisation of C.s into tissues produces a large number of characteristic C. types. It is thought that differentiation and specialisation involve also a loss of plasticity, in that the possibilities of regenerating lost portions of the organism decrease as the div. of labour increases; in the final instance only a limited ability to heal wounds is retained, and it is the least differentiated cells which take part in the process. Yet *de-differentiation* is possible, at least in lower forms; e.g. a small portion cut from a *Hydra*, and consisting of comparatively few C.s, which have differentiated, will de-differentiate to 'generalised' C.s, before reorganising themselves into a complete animal and differentiating again.

Growth. Following a period of increase in size, C.s multiply by direct div., or *amitosis* in which they constrict medially and ultimately separate, all their inclusions being reduplicated; they also do so by the more complex *mitosis* or indirect div. Here the centrosome divides, the 2 portions moving to opposite sides of the nucleus, whence they act as centres of attraction for the chromosomes, which divide, become more clearly visible, arrange themselves on a spindle of fine fibres between the centrosomes, and then move apart so that each new C. contains a complete set of chromosomes. Particular interest has been focused on chromosome div. in C.s, especially the div. which produces the germ C.s, because of the special role they play in heredity; for further details see GENETICS and HEREDITY. The relation of C. structure to heredity has given rise to the composite subject *cyto-genetics*. For bibliography see CYTOLOGY.

Cell, Voltaic, apparatus for generating electric current by chemical action. A simple form of C. may be arranged by partially immersing a plate of zinc and a plate of copper in dilute sulphuric acid. Little chemical action is at first apparent, but if the plates are connected by a strip of metal, a brisk action is set up, the hydrogen comes off at the copper plate and a current flows through the connecting strip. In the liquid the current flows from zinc to copper, in the wire—the external circuit—from copper to zinc. The chemical action is the solution of zinc in the acid, forming zinc sulphate. Owing to the consequent weakening of the acid, the adherence of a hydrogen film on the copper, and its reaction with the zinc sulphate, which results in a deposit of zinc on the copper plate (polarisation), the current soon ceases. Various types of C. have been evolved to obviate or diminish the polarisation effect. In all these C.s the zinc rod or plate is the negative terminal for the external circuit. Any C. has internal resistance, and when current flows, this is equivalent to a counter e.m.f., $e = rI$, where r is the internal resistance.

Daniell's cell. A glass vessel contains a solution of copper sulphate, kept saturated by crystals placed on an annular shelf below the surface of the solution. A perforated copper cylinder stands in the solution, and within this a thin porous cylinder of unglazed earthenware; this contains dilute sulphuric acid, in which is placed a cylinder of zinc. The hydrogen produced by the action of the acid on the zinc combines with the copper sulphate; the sulphate used up is made good by the crystals. A Daniell's C. has an e.m.f. of about 1.08 V., and remains constant for some hours.

Grove's cell. This differs from a Daniell's C. in containing nitric acid instead of copper sulphate, and platinum instead of copper. It consists of a flat rectangular vessel, partly filled with sulphuric acid, a U-shaped zinc plate, a porous pot containing strong nitric acid and a thin platinum foil. The disengaged

hydrogen decomposes the nitric acid, giving off nitrous fumes. A Grove's C. has an e.m.f. of about 1.96 V.

Bunsen's cell. This resembles Grove's C., the platinum foil being replaced by a rod of gas-carbon. The C. consists of a glass vessel containing dilute sulphuric acid; within is a cylinder of amalgamated zinc; within that a porous vessel containing nitric acid and a rod of carbon. The e.m.f. is 1.81 V.

Bichromate cell. This consists of a zinc plate which slides up and down between 2 carbon plates dipping into a mixture of potassium bichromate and sulphuric acid, or chromic acid and sulphuric acid. This solution rapidly acts on the zinc, so that the zinc plate is clamped above the surface of the liquid when the C. is not in use. The e.m.f. is about 2 V., but falls off after a while; for short experiments where a moderately high power is required these C.s are useful.

Lecaniché cell. This consists of a glass vessel about one-third full of a strong solution of sal ammoniac. The negative pole is a rod of zinc placed in this liquid; the positive pole is a rod of carbon placed in a porous pot which is tightly packed with manganese dioxide mixed with carbon. The porous pot is sealed with pitch, only the top of the carbon rod projecting. The C. quickly becomes polarised, but with rest recovers of itself.

Dry cells are usually C.s of the Lecaniché type, in which the liquid sal-ammoniac is replaced by a paste or jelly consisting of sal-ammoniac and some absorbent material. They are very convenient and portable, and are well adapted for electric pocket lamps.

Latimer Clark's cell. One form consists of 2 glass tubes joining to form a common trunk; the bottom ends are closed with a platinum wire sealed in each, and the common neck is closed with a ground-glass stopper carrying a thermometer. In one branch is mercury covered by a paste formed by mixing mercurous sulphate, mercury, and zinc sulphate, and in the other is an amalgam of zinc and mercury. Crystals of zinc sulphate are placed in both bulbs, and the whole vessel is filled with zinc sulphate solution. The C. is not economical, but it is remarkably constant in e.m.f., and was used as a standard C. before the Weston C. was developed.

Weston cell. Similar to the Clark C., but the zinc sulphate is replaced by cadmium sulphate and the zinc rod by an amalgam of cadmium. The present internationally accepted value for the e.m.f. is 1.01864 absolute practical volts at 20° C. This is for a C. constructed according to a strict specification. It was first introduced in 1892.

A C. of the above types gives a small current at a fairly steady voltage of 1–2 V. for a short time, sufficient to light a miniature lamp or work an electric bell system. Sev. C.s may be connected in series (the negative pole of one to the positive of the next, etc., Fig. 1), or parallel (all the positives together, all the negatives together, Fig. 2), for increasing

voltage or current respectively, or in mixed series-parallel batteries, for increasing both. Suppose the number of C.s grouped together in either system be n . The total e.m.f. in the series grouping is nE , the total battery resistance nr and

$$I = \frac{nE}{R+nr} = \frac{E}{\frac{R}{n}+r}$$

where R is resistance in rest of circuit.

In the parallel grouping the total battery resistance is r/n , and the e.m.f. is

that of a single C. Thus $I = \frac{E}{R+\frac{r}{n}}$

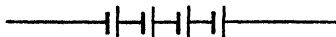


FIG. 1

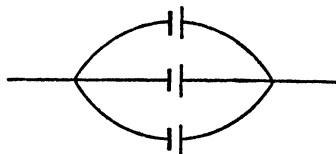


FIG. 2

See also ACCUMULATOR; ELECTROLYSIS, *Theory of voltaic cell.*

Cella, in Rom. architecture, the sanctuary or central portion of a temple, excluding the portico.

Cellaria, genus of polyzoans in the group Flustrina, which is typified by the genus *Flustra*. In appearance it resembles a seaweed, and it is common on Brit. coasts.

Cellarius, Christopher (1638-1707) (whose real surname was Keller), Ger. classical scholar, was a student at the univ. of Jena and Glessen. He had taught in 4 gymnasia, including that of Weimar, before he became prof. of hist. at the univ. of Halle in 1693. His many text-books, as, for example, his *Latin Grammar*, *Antibarbarus Latinus*, 1677, and *Latin Orthography*, 1700, did much to raise the fallen prestige of classical studies. Other of his manuals were among the first authorities on the Samaritan language.

Celle, Ger. tn in the *Land* of Lower Saxony (q.v.) on the Aller, 22 m. N.E. of Hanover (q.v.). It dates from 1292, and from the 14th cent. until 1705 was the residence of the dukes of Lüneburg-C., a branch of the House of Brunswick (q.v.). The former ducal palace, which contains a notable museum, is a Late Gothic and baroque building. There is an anct church, which contains the tombs of Sophia Dorothea, the divorced wife of George I of England, and of Caroline Matilda, wife of Christian VII of Denmark. The tn has a famous stud (founded 1735), and manufs. dyes, foodstuffs, furniture, leather goods, soap, buttons,

and drilling machinery. The notorious concentration camp of Belsen (q.v.) was near by. Pop. 60,000.

Cellier, Alfred (1844-91), organist, conductor, and composer. With Sullivan he was a chorister at the Chapel Royal. He held various posts as church organist and theatre conductor and made his name with a number of operettas. Of his earlier works *The Sultan of Mocha* was the most successful, but he achieved his greatest success in 1886 with *Dorothy*, the libretto of which was written by C. B. Stephenson. He owed a good deal to his friendship with Sir Arthur Sullivan, but his writing is remarkable for its delicacy and pleasing melody. He composed settings of Gray's *Elegy* (for orchestra and chorus). *The Mountebanks*, libretto by W. S. Gilbert, was produced after his death, in 1892.

Cellini, Benvenuto (1500-71), It. artist, fortunately wrote his own life. It reads like the most extravagant of adventure tales. B. in Florence, he was expelled from his native city after being apprenticed to a goldsmith because of his implication in some civil broil. After living in Bologna, where he became an excellent flautist, he eventually arrived in Rome. Here he became a court musician to Pope Clement VII, made silver vessels of every description, and finally in 1527, according to his own account, actually killed with his own hand the Constable de Bourbon, who was attacking Rome, and later mortally wounded the Prince of Orange. A little while after he had been pardoned for slaying his brother's murderer, he killed by accident a rival goldsmith. But Paul III set him free in 1534, as he wanted some dies in the mint engraved. Later, being falsely accused of embezzling pontifical jewels, he was thrown into an oubliette of St Angelo, escaped but was recaptured. The intercession of Cardinal d'Este alone saved him from death. His sojourn at the court of Francis I was cut short by his murderous attack on the plaintiff in a lawsuit. Finally C. returned to Florence, where he executed his famous bronze 'Perseus with the Head of Medusa' (in the Loggia dei Lanzi, Florence), under the patronage of Cosmo de' Medici. The merits of this masterpiece are such as to make it one 'of the most typical and unforgettable monuments of the It. Renaissance.' Of his many other works of art there have survived the famous silver salt-cellar of Francis I (now at Vienna), a medallion of his patron, Clement VII, and some gold medals. As an artist he has perhaps been over-rated, and his designs are often weak, though his technical ability was beyond doubt. But his versatile genius, which made him at once a goldsmith, sculptor, and engraver, led him also to write as well as treatises on his crafts the work on which to-day his fame largely rests, his unique and diverting autobiography. J. A. Symonds, who trans. it into English, says that from its pages 'the Genius of the Renaissance, incarnate in a single personality, leans forth and speaks to us.' Here the author narrates with a frankness

that disarms the moralist the whole story of his amours, his passionate devotion to arts, his shameless self-worship, and self-assertion running into almost incredible extravagances, the devout complacency with which he could contemplate a well-achieved homicide, and his alleged supernatural visions and angelic protection during adversity. See trans. by T. Nugent, 1771, 1812; T. Roscoe, 1822, 1904; J. A. Symonds, 1888; A. Macdonell (Everyman's Library), 1903; R. H. Cust, 1910; also life by R. H. Cust, 1912.

Cellular, or Areolar, Tissue, loose connective tissue consisting of fibres running

relatively unimpeded, and C. therefore must be regarded as a potentially serious condition. C. commonly arises from an incompletely localised septic focus such as a septic wound, a boil, or infected sting or bite. Or may also arise from an infection of an internal organ. *Pelvic C.* is caused by spread from an infection of one or other of the pelvic organs. Complete rest, heat, appropriate chemotherapy and draining of pus when present is the treatment of C.

Celluloid, Xylonite, or Pyroxylin Plastic, artificial colloid prepared from a mixture of nitrocellulose with camphor. It was



Mansell

SALT CELLAR OF FRANCIS I. BY CELLINI

in all directions and forming meshes called areolas. There are 2 kinds of fibres: white fibres, which are soluble in boiling water to form a solution of gelatin, and yellow elastic fibres, insoluble in hot water. In the spaces of this tissue are found lamellar cells, flattened cells usually attached to bundles of white fibres; plasma cells, not flattened; granular cells, packed with deeply staining granules; and leucocytes which have left the blood capillaries. It is the commonest connective tissue in the body, being found in the skin and also covering all the internal organs.

Cellulitis, diffuse inflammation of the interstitial tissue. When near the surface of the body, C. presents the classical signs of inflammation—redness, tenderness, and swelling. Nearly always infective in origin, C., as its definition implies, is not confined within the limiting boundaries of any one organ or defined group of tissues. Its spread through the loosely packed cells of the interstitial tissues is

first prepared in 1856 by Parkes and Spill in England, but the improvements in the manu. introduced by Hyatt, of Newark, New Jersey, revolutionised the industry and made it predominantly American. The name Xylonite is given it by the leading Brit. manufacturers, Brit. Xylonite Co. The nitro-cellulose is first made from substances composed essentially of cellulose, such as rags or, more particularly, tissue-paper. Shreds or strips of the latter are steeped in a combined bath of sulphuric and nitric acids of such composition as not to produce the explosive gun-cotton. Nitro-cellulose is thus produced, and great pains are taken to extract the excess of acid, the presence of which produces deterioration in the final product. This is done by thorough washings, and the water is either pressed out by hydraulic pressure or replaced by alcohol. Drying by heating would be too dangerous owing to the risk of explosion. The next process is to break up the cakes of nitro-cellulose

and add to it camphor dissolved in ethyl alcohol in the proportion of 2 of nitro-cellulose or pyroxylin to 1 of camphor, and mix the whole thoroughly up in a kneader. In some cases flake camphor is added to the pyroxylin and the mixture in boxes sprinkled with alcohol until it settles down into a dough. At the same time colouring substances and a fixing compound are added, and the whole is made homogeneous. It is then rolled and worked in heated rollers and pressed by hydraulic pressure machines, and a cake produced of the material containing a quantity of the liquid solvent, which must be removed by keeping the substance in a heated room for prolonged periods. When all is removed shrinking has occurred, and the substance is ready for working in various processes. C. is buff in colour, but may be bleached by means of bleaching powder or other bleaching agent, and can also be made transparent in various colours. It is coloured by mineral colours, while coal-tar dyes are employed for colouring the transparent varieties. In the latter there is more need of a stabiliser or fixing compound than in the other varieties, since the generation of acid is more liable to cause deterioration. A substance is required that reacts with this acid to give products of reaction that will be harmless to the material, and it is found that compounds of urea serve this purpose very well. C. brought in contact with a flame burns more rapidly than paper, camphor distils off, and a good deal of free carbon is evolved. There is always a slight odour of camphor about it, except in the very best produced, especially when it is scratched. Non-inflammable C. has not yet been developed with sufficient success to become a commercial product. It is non-explosive at ordinary working temps. and is plastic at 75° C. Its hardness and elasticity at ordinary temps., together with its invulnerability, have led to its wide application in articles of daily use. Thus, for knife handles, piano keys, combs, and mirror backs its use is general, and its ease in working up has led to the imitation of such natural products as ivory, horn, and bone. Imitation marble is made by pressing together plates of differently coloured material, while imitation tortoise-shell can be and is much produced by pressure and heat on yellow plates between yellow coloured with brown. In recent years C. has been largely displaced by such modern plastics as bakelite, nylon, perspex, etc.

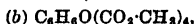
Cellulose, organic substance secreted by the protoplasm to form the primary cell-wall of plants, though not essentially present in all successive layers of the cell-wall after thickening has taken place. It is a carbohydrate, with a polymeric molecular structure, formula $(C_6H_{10}O_5)_n$; its characteristic reaction is that it turns blue when treated with sulphuric acid and iodine. Although noted for its insolubility, C. is dissolved by an ammoniacal solution of copper oxide without change, and by various bases such as tetra-ethyl-ammonium hydroxide, and by alkali

carbendisulphides, the basis of the viscose rayon process. Soaked in strong nitric and sulphuric acid, gun-cotton is obtained from C. Boiling with dilute hydrochloric or sulphuric acid for a long period converts C. into glucose. It is used in the manuf. of paper, collodion, rayon, plastics, and explosives, being obtained from wood pulp, cotton, and other plant resources. It enters into human diet in vegetable matter, but is not so easily digested by humans as by ruminating animals.

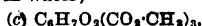
Cellulose Acetate is a substance formed by treating purified cellulose, in the form of cotton or bleached cotton linters, with acetic anhydride in the presence of sulphuric acid. It is a pale yellowish, transparent, non-inflammable mass and can be prepared in 3 chief forms:



soluble in alcohol, insoluble in water;



insoluble in water;



insoluble in water, alcohol, and ether. The first manufacturing process for C. A. was patented in 1894 by C. F. Cross. Miles in 1905 improved the quality of the product by introducing the process known as ripening, while the research work of the brothers Dreyfus during and since the First World War has resulted in the development of the acetate-silk industry. (See ARTIFICIAL SILK.) The C. A. as prepared on the commercial scale is a mixture of sev. acetate compounds. It is precipitated with water in the form of flocks, washed free from acid, dried, and dissolved in acetone. The resulting clear viscous solution is filtered and delivered to spinning machines. Amongst its uses are aeroplane dope, non-inflammable films, lacquers, and non-shatterable glass.

Celosia, tropical and temperate genus of Amaranthaceae, cultivated in England on account of the curious inflorescence, which is crested and flattened, and gives the plants the popular name of cockscomb. This appearance is due to the monstrous condition of the floral axis which has now become a common characteristic of the plants through cultivation. *C. cristata*, the common cockscomb, and its varieties, natives of tropical Asia, vary in height from 6 in. to 2 ft, and the colours from red to white.

Celsia, genus of Scrophulariaceae, known to Asia, Africa, and the Mediterranean. The flowers are 4-stamened and in racemes. *C. orientalis*, an annual, and *C. cretica*, a biennial, are hardy; *C. arcturus*, a shrubby perennial, makes a good pot plant.

Celsius, Anders (1701-44), Swedish astronomer, b. Upsala. He was prof. of astronomy in the univ. in his native town from 1730 to 1744. In 1733 while in Nuremberg he pub. original observations of the aurora borealis. He invented the centigrade thermometer (q.v.) in 1742, and marked the boiling-point of water 0° and the freezing-point 100°. A colleague, Martin Stromer, 8 years later inverted

the scale. For the centigrade degree see METROLOGY.

Celsius, Magnus (1621-79), Swedish astronomer, b. Alfta, Helsingland. He was a prof. of mathematics and astronomy at Upsala, where he discovered the Helsing runes (q.v.) and deciphered them. He d. at Upsala.

Celsius, Olaus (1670-1756), son of Magnus C., b. Upsala. He held the post of prof. of theology and oriental languages at the Upsala Univ., and was also a provost of the cathedral. He was a great botanist, and author of *Hierobotanicon*, a work on the plants mentioned in the Bible. He was the patron and instructor of Linnaeus (q.v.).

Celsius, Olof, the Younger (1716-94), Swedish historian and poet, b. Upsala. He became prof. of hist. at Upsala Univ. in 1747. Later he entered the Church and in 1777 was made Bishop of Lund. He was one of the original members of the Swedish Academy. He wrote, among other works, a hist. of Gustavus I (1746-1753), and a hist. of Eric XIV (1774), and was famous for his brilliant style and keen criticism.

Celsus (c. AD 178), one of the earliest opponents of Christianity, lived during the reigns of the Antonines, and is believed to have been a friend of Lucian. He was the author of *The True Account (Alēthēs logos)* about nine-tenths of which has been preserved for us in fragments by Origen, who undertook to refute C.'s arguments, and did so in his work, *Contra Celsum* (AD 248). The heathen's attitude is not that of a philosopher, but rather that of the man of the world whose religion is mere agnosticism, and who has brilliance without depth. He upbraids the Christians for their absurd credulity, their party schisms, their exorcism of demons, and for the disreputable character of their proselytes, who are rogues, poisoners, thieves and idlers, women and slaves. See L. Rougier, *Celse*, 1925.

Celsus, Aulus Aurelius Cornelius (25 BC-AD 50), Lat. writer on medicine and surgery. He wrote sev. works, of which only one remains entire, his treatise *De Medicina* in 8 books. Books i and ii deal principally with diet and principles of therapeutics and pathology; iii and iv with internal diseases; v and vi with external diseases and pharmaceutical preparations; and vii and viii with diseases calling for surgical treatment. His method in dealing with disease is apparently to allow nature to take its own course, though he also advises a free use of the knife on occasions. His treatise on surgery points to the fact that many of the most delicate and serious operations were performed in his time. The *De Medicina* was one of the first medical books to be printed (1478) and has since been pub. in over 100 eds.

Celsus, P. Juventius, Rom. jurist, son of a jurist, Juventius C. (c. 67-c. 135, or about the year when Hadrian d.). Was accomplice in a conspiracy against Domitian along with Nerva and others, but contrived to exculpate himself and his companions. Subsequently he was

highly favoured by Nerva and Trajan. He was praetor at some time and twice consul; the date of the first is not recorded, though the second is said to have been AD 129. He was a friend of Hadrian. Only fragments of his legal commentaries are extant. Among these are a digest of 39 books, 7 of which are a commentary on the *Lex Julia et Papia Poppaea* (prohibiting the marriage of senators and freedwomen and all freeborn with actresses or women of openly bad character) an attempt (with other *leges* of a similar kind) to restore virtue to private life by a system of rewards and penalties. In these fragments there are sev. passages which betoken great self-confidence and dogmatism: for where most jurists prefix their opinions with a *videtur* (or as we should say, 'it is submitted that, etc.') C. stated his opinions unreservedly. But that he was an eminent jurist is shown by the fact that he is so often quoted by many of the most famous jurists of a later time—Pomponius, Ulpian, Paulus, and Maecianus.

Celt (from Low Lat. *cellis*, a chisel) has been used by both Eng. and Fr. archaeologists to designate the stone and bronze axe-heads used by the primitive peoples of Europe. The normal length of a stone C. is 7 in., but it varies from 1 to 20 in.; a bronze C. may be 10 in. long, but is usually 5 to 6. The better bronze C.s often had a socket or hollow for the handle. C.s served also as chisels, adzes, etc., and were superstitiously regarded as 'thunderbolts,' or as implements endowed with strange curative powers. See CELTS.

Celtiberi, powerful race of anc. Spain, said to have sprung from the intermarriage of the Iberians, who probably reached Spain during Neolithic times, and Celtic invaders from Gaul. They inhabited an inland dist. (approximately the present SW. of Aragon and N. and E. of Castile). Celtiberia, however, was often used to include country right to the Guadalquivir's sources. Subdued by Hannibal, they served as Carthaginian mercenaries against Rome, later becoming Rom. mercenaries. T. Sempronius Gracchus subdued their country, 179 BC, but they were always rebelling. Finally, Scipio Africanus conquered them by the destruction of Numantia (133). They joined Sertorius later, but after his death (72) became quite Romanised.

Celtic Languages. In historical times the C. L. were the most W. linguistic group of the Indo-European (q.v.) linguistic family. The earliest direct sources regarding these languages come from classical authors and inscriptions belonging to the first cents. of the Christian era, while the earliest glosses and short literary texts belong to the 8th cent. AD. Thus they are far more recent than the linguistic remains of the Hittite, the Indo-Iranian, the Gk. and Lat. languages, and even more recent than early Gothic and Armenian texts, but older than Slavonic and Baltic.

However, indirect sources, such as names of persons and places, help us to reconstruct the early hist. of the Celts.

Until the 6th cent. BC they inhabited the main part of W. Germany and N. Gaul; but in the course of time they were in possession of the Brit. Isles, the whole of Gaul, a great portion of Spain, N. Italy, the Balkan Peninsula, and part of Asia Minor. But their direct linguistic influence was minimal. In time the Celtic ter. became vastly reduced, and from the 11th cent. onwards C. L. were spoken only in some portions of the Brit. Isles and NW. Gaul.

In its linguistic relationship with the other Indo-European branches the Celtic group occupies a mediate position between the Italic and the Germanic languages.

C. L. may be subdivided into (1) Continental Celtic, or Gaulish, represented by sev. inscriptions, such as the *Graufesenque* *Graffiti*, the *Coligny Calendar*, and the *Vienna Glossary*; (2) Goidelic, including Irish, Scottish, Gaelic, and Cornish; and (3) Brythonic or Cymric, including Welsh, Breton, and Cornish. It is often asserted that the C. L. left no trace in modern English, having disappeared with the reputed extermination of the Celts. The best authorities concur in seeing abundant traces. The very idiom 'I am speaking' is Celtic, and is impossible of an exact rendering in any continental tongue; the employment of the auxiliary 'do' as an intensive is another common illustration of a distinctive Celtic idiom, and corresponds to the Gaelic *dean*. Whether or not Celtic is doomed to disappear as a spoken language, nothing can destroy its imperishable influence on literature. So great an authority as Matthew Arnold declared that rhyme, the most striking characteristic of our modern poetry as distinguished from that of the ancients, is a direct legacy of the Celts, and in this opinion he is confirmed by Zeuss, the most distinguished of Ger. Celtic scholars. Celtic was the common language of the greater part of the Brit. Is. before the Rom. invasion. It has been observed that even at the Norman Conquest the great majority of the Eng. people were Celts, and that the stereotyped belief in the virtual extermination of the Britons, resting as it does on the sole authority of Gildas, as echoed by Bede, is not wholly correct. If this objection is accepted, many philological difficulties disappear, and it is probable that the etymologist Mackay is justified in assuming an unlimited blending of Celt and Saxon reflecting itself in the language, literature, and national character of the English. Certain features of Celtic are found in the colloquial speech of the Eng. people of to-day, and also underlie the Fr. and Sp. and some It. dialects. The 'Low Latin' of the Middle Ages, so beloved of law books, is often a compound of Celtic words with Lat. terminations. Even the word *Angle* in the race appellation A.-S. is by some scholars regarded as a corruption of *An Gael*, or 'the Gael.' Those and similar indications are the best possible refutation of Dr Johnson's assumption that Celtic was the rude speech of a barbarous people, who had few thoughts to express, and that, such as it was, it

was never a written language. See also IRISH LANGUAGE AND LITERATURE and SCOTTISH GAELIC LANGUAGE AND LITERATURE. See W. Stokes, *Urkeltscher Sprachschatz*, 1894; A. Holder, *Altkeltscher Sprachschatz* (3 vols.), 1896-1911; H. Pederson, *Vergleichende Grammatik der keltischen Sprachen* (2 vols.), 1903-13; G. Dottin, *La Langue gauloise*, 1920; L. Weigerber, 'Die Sprache der Festlandskelten,' *Berichte der röm.-germ. Kommission*, 1931; H. Lewis and H. Pederson, *A Concise Comparative Celtic Grammar*, 1937.

Celtic Ornament, which grew out of the Iron Age decoration in the Brit. Isles, may, for historical purposes, be divided into 2 periods: the pre-Christian, extending from 250 BC to AD 600, and that which followed the introduction of Christianity, and attained its highest excellence in the 11th or 12th cent. In the earlier stage the metal most commonly used was bronze, and the chief fields of decoration were shields, scabbards, bracelets, harness mountings, and horse trappings. Repoussé work (q.v.) of low and high relief, done on thin plates which were afterwards riveted into position, has been found throughout the Brit. Is. in the beds of rivers and lakes, in earth houses, crannogs, and grave mounds, where also other products of Celtic art are constantly being found. Sometimes the repoussé design is enriched by champlevé, enamels of yellow, blue, green, and red, or by patches of coloured vitreous pastes. This is the case with a unique oval bronze shield, rescued from the Thames, on which there are 27 settings of red enamel. During these early cents. the Celtic artists depended on divergent spirals and elliptical curves for their designs, engraved lines or dots like a diaper filling up the pattern, which thus showed up against the plain groundwork. Many fresh elements of ornament, such as fretwork, with involved patterns, diagonal frets, and oblique lines, interlaced work, and diapers of I- and Z-shaped designs, were added as further embellishments when paganism gave way before the new religion. And, further, there were new bells, croziers, shrines, churches, and above all the MSS. of the gospels and psalters as fresh openings and encouragement for the Celtic artist. Some Byzantine influence may be traced, but artists had evidently much recourse to the earlier patterns of Celtic metalwork. The Book of Kells in Trinity College, Dublin, and the Lindisfarne Gospels in the Brit. Museum, with their beautifully illuminated pages, their elaborated patterns of an almost inexhaustible variety, offer the finest illustration of the art of this period. But the enamelled metalwork which still flourished is nobly represented by the Ardagh Chalice; and the Tara and Rogart Brooches and the Cross of Cong are fine examples of filigree and chasing work in gold and silver.

Celtis, Konrad (1459-1508), Ger. humanist, b. Würzburg; studied under Rudolph Agricola at Heidelberg, where he founded a literary society. In 1486

he pub. *Ars Versificandi et carminum*, which led to his appointment as first poet laureate of Germany. In 1497 he accepted the chair of poetry and eloquence at the Collegium Poetarum et Mathematicorum, Vienna. C. discovered in the convent library of St Emmeran at Regensburg the writings of Illosvitha of Gandersheim, which he pub. in 1501. His works also include *Amores*, 1502, and *Odae*, 1513, ed. by F. Pindter, 1934 and 1937 respectively.

Celts, generic name of an anct people, the predominant element in central and W. Europe before the rise of Rom. power and the influx of Ger. tribes. Great confusion has resulted from inaccurate use of the words Celt and Celtic. The dark-complexioned people of France, Great Britain, and Ireland have been called Black C., while the tongues of the races of W. Scotland and Ireland are commonly termed Celtic. More properly they are Gaelic. Anct writers never used the word of dark peoples. The Celtic characteristics were great stature, fair hair, and blue or grey eyes. All fair-haired peoples N. of the Alps were called *Keltai*. Physically there were 2 main groups closely allied: Scandinavians (Teutons in modern writers), and peoples of France, Switzerland, and Italy (Celtic or Alpine race), standing midway between the Teutonic and the Mediterranean race (dark). C. appear to have settled in Gaul between 1200 and 700 BC. Some had dwelt in the Alps and the Danube valley from the Stone Age. Others passed into Italy in the Bronze Age. In the 6th cent. BC they spread into Spain, and from intermarriage with the native Iberians in the N.-central parts were called Celtiberi (q.v.). About the 4th cent. BC a great wave of C. invaded Italy, occupying Rome after the battle of the Allia, 390 (Livy, v. 34). Bought off, they retired to Sena Gallica. The Bituriges (a name still surviving in Berri) were the chief tribe. Others were the Arveni, Senones, Aunbarri, and Aedui. These Gauls are often also called Cimabri. The most dreaded tribes came from the Baltic and the N. Ocean; hence the peoples now called Teutons were named C. The height of their power was about 400 BC. In the 3rd cent. they had spread as far as Greece and Asia Minor. Their raids were the terror of antiquity, but Caesar and Augustus reduced them to inactivity. Under the latter Galatia, where numbers of C. had settled, became a prov. They founded no lasting state alone and preferred a pastoral to an agric. life. Their strength made them formidable foes, but they lacked discipline. Cato described them as 'devoted mainly to warfare and witty conversation.' In the Brit. Isles they remained independent for cents. These is. C., who were but colonists, were far less civilised than the continental C. During the 400 years after Caesar's expedition to Britain they became closely allied with their Rom. conquerors. They wore a sleeved blouse and trousers, fitting close to the ankle, with a tartan plaid across

the shoulder fastened by a brooch, much like the costume of highlanders in Queen Anne's time. They often had gold or bead ornaments, and enamel on their armour. The C. of Gaul and Belgium wore plated armour or chain-mail coats. They could work various metals (copper and iron), and discovered bronze. Among their weapons were swords, daggers, bows, pikes, slings, and javelins. They used 2-wheeled chariots in war with a bronze scythe projecting on either side, and were exceptionally good seamen. They had Druids, or priests, who performed magical ceremonies, which survived in the forms of the 'ordeal', augury, exorcism, etc. The clan system was deep-rooted. They had musical, poetical, and literary tastes, and were distinguished for dramatic talent. The group of languages which are commonly known as Celtic belong to the Indo-European family. They now comprise Welsh, Breton, Irish and Scottish Gaelic, and Manx. Cornish has died out. See also MYTHOLOGY and RACE. See J. Beddoe, *Celtic Races of Britain*, 1885; W. F. Skene, *Celtic Scotland*, 1886-1890; A. H. Keane, *Man, Past and Present*, 1899; J. Ithys, *Celtic Folklore*, 1901; D. Mathew, *Celtic Peoples and Renaissance Europe*, 1933; H. Hubert, *The Greatness and Decline of the Celts*, 1934; V. C. Childe, *Prehistoric Communities of the British Isles*, 1940; J. A. MacCulloch, *The Celtic and Scandinavian Religions*, 1949.

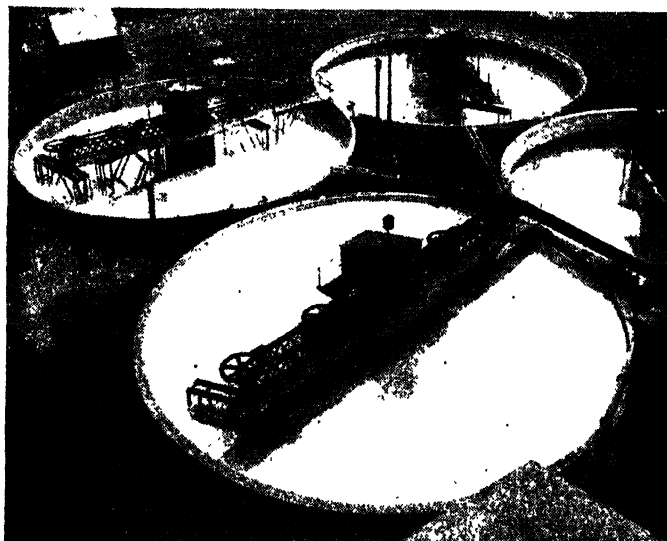
Celyphus, genus of dipterous insects which resemble little beetles rather than 2-winged flies, on account of the enlarged scutellum which hides the reduced abdomen. *C. abjectus* inhabits Java, *C. scutellatus* the E. Indies.

Cement, material used for binding surfaces together or for uniting particles in one mass. The chief kind used for building purposes is *Portland C.*, which consists of various aluminates and silicates of calcium, formed by heating chalk or limestone with clay. It was invented by Joseph Aspdin, of Leeds, in 1824, and was first developed on the lower reaches of the Thames and Medway, where mud was plentiful; this locality still produces most of the C. made in Britain. The process of manuf. has 3 stages: (1) the preparation of the raw materials; (2) calcining the clinker; (3) crushing and grinding to give the finished product. Two alternative processes, the wet and the dry, are in use. In the wet process, the materials are mixed in a wash mill, which consists of a basin of brick or masonry with a masonry pier in the middle. On the latter is fixed a vertical revolving shaft to which horizontal arms are attached. From these hang harrows or vertical iron bars which dip into the materials mixed with water and rotate with the shaft. This thoroughly mixes up the sludge and breaks up any of the lumpy parts. The product is known as slip or slurry and passes out of the mill through a grating of such div. as to let pass any particles under a certain fineness. Stones accumulate at the bottom of the mill basin and can be easily removed, while any hard lumps of chalk must be ground by rollers. In the dry

process, the materials are crushed and dried before mixing. After either of these processes the material is ready for calcining, generally in a rotary kiln. This consists of a long cast-iron tube, lined with firebrick and slightly inclined to the horizontal. The slurry or dry powder enters at the upper end and the fuel, usually coal dust, at the lower end, borne by the draught. The kiln rotates slowly, and the calcined clinker emerges at the lower end. The final process, the grinding of the clinker, is performed in 2 stages, coarse grinding and fine; the resulting

such as breakwaters, piers, sea-walls, etc. The nodules consist of about 20 per cent of silica and 15 per cent of alumina. They are calcined to drive off the carbon dioxide and ground fine.

Keene's C. and *Parian C.* are types of plaster (q.v.) based on gypsum. Another class is the magnesium oxychloride or *Sorel's C.s.* formed by the reaction between magnesium chloride, water, and prepared magnesia. Mixed with fillers such as wood-flour, cork, sand, asbestos, ground limestone, etc., they are much used for flooring. See also ADHESIVE. See



Cement Marketing Board

A GROUP OF SLURRY MIXERS

powder is so fine that about 9/10ths of it will pass through a 170-mesh sieve (i.e. one with 28,900 holes to the sq. in.). Tests and quality requirements to be satisfied by various classes of Portland C. are laid down in Standard Specifications.

High-alumina C. may sometimes be used where Portland C. would be unsuitable, as when concrete is required to gain strength very rapidly after being placed, or when concrete foundations have to be laid in certain chemically aggressive soils. *Roman* or *Parker's C.* was unknown to the Romans, being invented in 1796. It was much used before the invention of the cheaper and stronger Portland C. It is prepared from the nodules known as septaria which are found in shale, especially in the Isle of Sheppey and its neighbourhood. It is similar to hydraulic lime, being quick in setting, and owing to the fact that it sets rapidly under water was used extensively in hydraulic works,

F. M. Lea, *The Chemistry of Cement and Concrete*, 1956.

Cementstone, name given geologically to argillaceous limestone, particularly suited to the manuf. of cement. C.s. occur in the Tertiary London Clay, but are best developed, in the Brit. Isles, in the Lower Carboniferous rocks of N. England and of Scotland as the C. Group, a subdiv. of the Calciferous Sandstone Series (q.v.). This group, deposited in inland lakes or arms of the sea, formed between fresh-water deposits of the Old Red Sandstone and younger marine Carboniferous sediments. It makes an excellent building stone, much used in Edinburgh.

Cemetery (from the Gk *koinôtérion*, a sleeping-place), piece of ground which is specially set apart for the burial of the dead. The name was originally given to the underground burial-places of the Romans. The Greeks always made their

C.s outside the cities, and the Romans placed their tombs generally by the side of the public roads. In the early ages, the Christians used to hold their religious ceremonies in the C.s, and it is believed that this fact brought about the practice of always consecrating the ground that was to be used for the dead. In modern times it has become the rule for each sect or denomination to have its own burial-ground, and each C. is consecrated according to the formula peculiar to the sect to which it belongs. Sometimes one C. is allotted to various denominations for the convenience of everyone living in that dist. See also BURIAL ACTS and BURIAL CUSTOMS.

Cenchreae: 1. (Now Kenkri) was a city on the E. side of the isthmus of Corinth in the Peloponnesus. It was from this port that St Paul embarked when he left Corinth for Jerusalem.

2. Also the name of an anct Gk settlement in the Troad, probably situated some distance N. of Eneke in the plain of Bairamich (NW. promontory of Asia Minor).

Cenci, Beatrice (1577-99). It. girl whose fame rests on the tragic and sordid character of her family hist. She was the child of Francesco C., a wealthy, passionate man, who proved a dissolute liver and a harsh father. She was involved in a plot to murder Francesco, who was assassinated whilst he slept, and after torture and confession was beheaded with her mother in 1599. Shelley's magnificent tragedy, *The Cenci*, is historically inaccurate, but has nevertheless made Beatrice one of the most heroic and tragical of women. Modern research has revealed her in a somewhat different light.

Cenis, Mont (It. *Monte Cenisio*), Alpine peak (11,792 ft) and pass (6893 ft) between France (Savoie) and Italy (Piedmont). The famous Mont C. tunnel (opened in 1871) is not really under the pass itself, but lies below the Col de Préjus, some 15 m. W.; it is 7 m. long. The railway runs from Chambéry to Susa (qq.v.), via Modane and Bardonecchia. The carriage road, built by Napoleon between 1802 and 1810, goes from Lanslebourg to Susa. The Little Mont C. (7166 ft), to the SW., connects the main pass with the Étache valley on the Fr. side. The Mont C. pass is said by some to have been used by Hannibal (q.v.).

Cenisio, Monte, see CENIS, MONT.

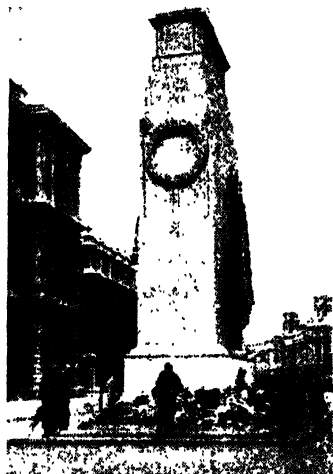
Cennini, Cennino, It. painter of the late 14th to early 15th cent., b. Colle di Valdelsa, worked with Agnolo Gaddi at Florence. He is of importance as the author of a famous treatise on painting, his *Trattato della Pittura* (Eng. trans. ed. by Mrs Herrington, 1899), which details the methods and precepts of the school of Giotto and gives an early account of the oil-painting technique.

Cenomani, offshoot of the Auleri, a people who inhabited Gallia Celtica, an anct div. corresponding to the modern Maine in the dept of Sarthe. This people helped Vercingetorix in the rising against Caesar in 52 bc, and constituted under Augustus a *civitas stipendiaria* of Gallia Lugdunensis. They were allies of Rome

in the Gallic war (225 bc) and in the second Punic war, but they helped the Gauls in their revolt under Hamilcar (not the father of Hannibal) and only finally submitted to Rome following their defeat by Gaius Cornelius (197 bc).

Cenomanian, name applied to lower part of the Upper Cretaceous, notable for a widespread transgression of the seas over what had been land. The Lower Chalk of Britain was laid down in C. times.

Cenotaph (Gk *kenos*, void; *taphos*, a tomb), monument or memorial stone to the memory of a person whose body lies



D. McLeish
THE CENOTAPH, WHITEHALL, LONDON

elsewhere. C.s are very common for drowned persons. An added significance attaches to the word since the First World War. In England, the C. *par excellence* is that which stands in Whitehall, London, near the end of Downing Street. The architect was Sir Edwin Lutyens, who drew up the plans overnight and submitted them to the gov. the next morning. The design is of striking simplicity, and has an air of dignity seldom found in such memorials. The original C. was a temporary structure made of wood, erected hastily for the peace procession on 19 July 1919. In 1920 it was decided that the temporary structure should be demolished and a permanent one erected on the same site. This gave rise to much criticism in the press; it was considered that the site was unsuitable owing to the busy traffic at this spot, and that the monument should be placed on one of the grass plots in Parliament Square near the Houses of Parliament. The original view, however, prevailed, and no traffic

problem has arisen. As the memorial is to all who *d.* or were killed in the First World War and who lie buried in every theatre of war, irrespective of creed, denomination, or belief, a purely Christian inscription was out of place. It was therefore decided to inscribe on it the words 'TO OUR GLORIOUS DEAD.' It was intended that the flags upon it should be of stone, the colours being impregnated by a new process. This, however, was not carried out, and 3 bunting flags fly on 2 faces of the memorial. It is still the general practice of all male civilians to uncover their heads in passing the C. out of respect for the dead who gave their lives in the two world wars. On the Sunday nearest the anniversary of the signing of the Armistice (11 Nov.) a mass memorial service is held at the C. in which the royal family, the gov., and representatives of all important bodies, etc., participate. The service was, however, omitted during the war years 1939-1945. A new inscription to commemorate the dead of the Second World War was unveiled by King George VI on 11 Nov. 1946.

Censer (Lat. *incendere*, to kindle), vessel for the burning of incense. Also called a thurible.

Censor (Lat. *censere*, to assess, estimate): 1. Originally the name of 2 Rom. officials, first appointed in 443 BC. Till 351 only patricians were C.s; the plebeian Marcus Rutilius was elected in that year (Livy, vii. 22). In 339 Lex Publilia enacted that one must be a plebeian. In 131 both were plebeian for the first time. C.s were elected on the same day in Comitia Centuriata, with a consul presiding. The term of office, at first 5 years, was later limited to 18 months. This magistracy was considered the highest dignity in the state, except dictatorship. The chief duties were three: (a) the original taking of the census, or register of citizens and their property (held in the Campus Martius); (b) the *regimen morum* (regulation of morals), most dreaded of all their powers, this superintendence gradually spreading to private as well as public life; (c) administration of the state finances, including regulation of *tributum* (property tax) and of *vectigalia*, which were usually leased out to speculators (*publicani*, 'farmers' of the taxes). Only his colleague's *intercessio* (veto) could override a C.'s decisions. They could degrade men from or promote them to the rank of senator or knight at choice, until Sulla's legislation, 81 BC. They might class citizens with *aerarii* with no vote. They introduced various sumptuary laws. In 338 they drew up the list of senators (*lectio senatus*). In 265 a law forbade re-election to censorship. Their dreaded stigma, *nota censoria*, might be affixed to any name on their lists, but the successors of 1 pair of C.s could remove it. Augustus exercised censorial powers himself as consul (8 BC and AD 14). Claudius, Vespasian, and Domitian revived the office. Trajan and later emperors acted as C.s without actually assuming office.

2. Name now extended to one who

controls or censures the action of others; to critics of literary or artistic work, and judges appointed by a gov. to examine plays or songs before their publication. It is also the title of the official head of non-collegiate students at Oxford and Cambridge. The C.s of the Royal College of Physicians grant licences.

3. See PSYCHOANALYSIS.

Censorinus (3rd cent. AD), Rom. grammarian, author of a lost work *De Accenti-bus*. He also wrote *De Die Natali* (AD 238), which is dedicated to his patron Q. Cacerellius. This work is extant. It deals with a variety of subjects ranging from the natural hist. of man to astronomy, chronology, and mathematics. See the critical ed. of O. Jahn (1845).

Censorship, see INDEX LIBRORUM PROHIBITORUM; LITERARY CENSORSHIP; PRESS, FREEDOM OF THE.

Censorship, Film, Britain. In 1912 the British Board of Film Censors was set up by the film industry itself. All films except newsreels are viewed and passed out or cut under U, A, and X gradings. 'U' films may be seen by general audiences; 'A' films may be seen by children under 16 only accompanied by an adult; and 'X' films may not be seen at all by anyone under 16. A small number of films are banned. In 1921 the Middd Co. Council inserted a clause in its licence that no film might be shown in its area without a certificate from the Board of Film Censors. Soon after, all the local authorities in the country accepted this condition, reserving the right, however, to pass a film banned by the board or to ban a film passed by the board.

France. Fr. censorship operates under the Ministry of Information through a commission made up of representatives of various gov. depts. Visas are issued by the ministry; the commission always advises at script stage. Subtitles or dubbing scripts for exported versions also require visas. Classification is twofold—adults 16 and over and general audiences.

Italy. Censorship in Italy is official and is a function of the Ministry of Tourism, Entertainment, and Sport, on whose behalf a censorship committee issues visas. No film may be shown without a visa. Classification is twofold—adults 16 and over, and adults and children. The censorship does not read scripts or give advice during production. In addition to the official censorship there is of course widely influential Church control and many cinemas undertake to recognise Church pronouncements on films.

United States of America. Control of films in the public interest depends almost entirely on voluntary acceptance by the industry of the production code which is operated by the Motion Picture Association of America. When a film is approved it receives a M.P.A.A. seal, and the number appears on the credits. There is no law against the showing of films without a seal, but wide public showing is difficult without it.

Censorship of the Drama, power that originally sprang from the royal prerogative. The C. of the D. has existed

ever since the rise of the Eng. drama in the period of the Renaissance. In the time of Henry VII court entertainments were supervised by a master of the revels, and from that date to the middle of the 17th cent., when all theatres were suppressed by law, playwrights were subject to the control of either the master of the revels or the court of Star Chamber. According to writers on the constitutional hist. of England, it is not certain at what date the lord chamberlain first began to exercise a direct control over plays, but as early as 1628 he either personally or through his subordinate, the master of the revels, licensed and exercised a general control over dramatists. From being an emanation of the royal prerogative his powers ultimately, in 1737, became statutory. The object of the Act of 1737 was mainly political, a fact which was sufficiently indicated by the preamble to the Act, which recited that its purpose was to restrain the political and personal satire which was then prevalent on the stage, which the gov. of the day found embarrassing, and which the censorship as it then existed was found ineffective to curb. On the passing of this Act the lord chamberlain appointed a licenser or examiner of plays, with a salary of £400 a year, and that office has continued in spite of criticism down to the present time. The Act of 1737 conferred an unfettered power of veto on the lord chamberlain, and it was only when the Theatres Act, 1843, was passed that the legislature gave any indication of the principle on which the veto was to be exercised. Under the Theatres Act the lord chamberlain has (1) power to prohibit the performance of unlicensed stage plays anywhere; (2) power to license theatres in certain places; (3) a practically arbitrary right to ban any stage play which in his opinion is contrary to 'good manners, decorum, and the preservation of the public peace,' words which the joint committee of 1909 characterised as vague, and 'the only existing statutory authorisation' of this particular aspect of the lord chamberlain's powers. Under this Act every new play and every addition to an old play must be sent to the lord chamberlain by the theatre manager who proposes to produce it at least 7 days before it is intended to be performed, accompanied by a fee for perusal of not more than 2 guineas. Plays written before the Act are exempt from the lord chamberlain's veto. The lord chamberlain has local jurisdiction to licence all theatres in the cities of London and Westminster, in Finsbury, Marylebone, the Tower Hamlets, and also in Windsor and other places where there is a royal residence. The co. councils license places to be used in their cos., and the univ. authorities of Oxford and Cambridge have a veto as to the performance of plays within their respective jurisdictions.

The C. of the D. was hardly likely to go unchallenged in the progress of time. But until comparatively recent years opposition to it was of no very open or sustained character, and 3 joint com-

mittees pronounced in favour of its continued existence.

The year 1908 and succeeding years saw a remarkable manifestation of hostility to the C. of the D. on the part of a number of distinguished persons in the literary world, the exciting cause of which was the refusal by the lord chamberlain, on the advice of his examiner of plays, to license 3 plays—*Waste*, a skit on *An Englishman's Home*, and *Monna Vanna*. As a result of widespread criticism of his action in the press, a joint committee of both Houses was appointed in 1908 to inquire into the working of the C. of the D. A considerable number of well-known writers, actors, and theatre managers gave evidence before the committee. Generally speaking, the dramatists and other writers were against, and the actors and managers in favour of, the continued existence of the C. of the D. A remarkable feature in the evidence was the admission by the examiner of plays that in advising the lord chamberlain on the various plays submitted to him he proceeded on no principles that could be defined, but based himself on custom, and followed the precedents of the office: his practice was to refuse a licence where plays were avowedly adapted from the Scriptures, contained political allusions likely to jeopardise friendly relations with a foreign state, or had an immoral tendency. Since his assumption of office in 1895 the examiner said that some 7000 plays had been submitted to him, of which 43 were refused licences, though 14 of these were subsequently reconsidered and the licences issued; the majority of his refusals were on grounds of immorality. The figures given by the examiner, however, in no way represented the true measure of his activity, for in countless instances plays were only licensed after modifications to meet objections. The absence of principle or certainty in the quasi-judicial functions of the reader was exemplified by the refusal to license Shaw's *Mrs Warren's Profession*, d'Annunzio's *La Città Morta*, and *The Breaking Point*, while at the same time passing *Die Walküre* and *The Christian*, and other plays which, though dissimilar in treatment and action, yet contained parallel incidents. The grievance of the dramatists' grievance was that the suppression of a play before production was an excessive use of executive power, and cast a stigma on the profession of the dramatist; and that it was an anomaly to place the drama under restrictions other than those imposed by the ordinary law of libel and blasphemy. The actors, on the other hand, feared that if the C. of the D. were replaced by magisterial and police control an element of uncertainty would be introduced into their calling, and place in constant doubt the employment of numbers of persons who were not directly concerned with the ethics of the dramatic art. The committee recommended: (1) that the lord chamberlain should remain the licenser of plays, with the duty of licensing any

play submitted to him, unless he considered it indecent; offensively personal; calculated to do violence to the sentiment of religious reverence, to impair relations with any foreign power, to cause a breach of the peace, or to conduce to crime or vice; or as representing in an invidious manner some living person, or some person recently dead; (ii) that it should be entirely optional to submit a play for licence, and legal to perform an unlicensed play. Where any unlicensed play contravened the stated bounds the matter should be left to the director of public prosecutions. In spite of repeated questions in the House, and a petition to the king signed by 60 dramatists and a number of musicians, artists, novelists, and representatives of repertory theatres and dramatic societies, nothing was done to give legislative effect to the proposals of the joint committee. An account of the sittings of this committee together with a sane criticism of the present system of the C. of the D. is contained in the introduction to Bernard Shaw's *The Shewing-up of Blanco Posnet*, 1909. One weakness of the C. of the D. is that pornography when sugared with farce and fun is more likely to be granted a licence than a play of serious intent. It is notorious that variety shows invariably escape the censor, and moreover the examiner of plays, who considers only the text of a play, has no control over its production. However, *Young Woodley* by John Van Druten, 1929, was refused a licence which was afterwards granted when a private performance had been witnessed. Three notable plays recently banned in Britain are Arthur Miller's *A View from the Bridge*, Robert Anderson's *Tea and Sympathy*, and Tennessee Williams's *Cat on a Hot Tin Roof*. The ban however, has been evaded by the formation of a theatre club, with a membership fee of 5s. a year. Paradoxically, as the result of the notoriety achieved by a banned play, it is probable that these plays have attracted a wider public than they would normally have done. It is also curious that radio and television drama, with its far wider public, is exempt from the lord chamberlain's authority. In the U.S.A. the Wales Act was inaugurated in New York State in 1927, and by its terms a theatre which has seen the performance of a play subsequently banned in the police courts may be padlocked for a whole year, to the heavy loss of its possibly innocent owner. In Boston theatres are licensed for a season, but licences may be suspended by order of the mayor, the police commissioner, and the chief justice. The work done in England by the lord chamberlain's dept is in America carried out by the secretaries of watch and ward societies. Of the 2 the lord chamberlain's office is the more susceptible to public opinion.

See V. C. Gildersleeve, *Government Regulation of the Elizabethan Drama*, 1908; F. Fowell and F. Palmer, *Censorship in England*, 1913; and M. L. Ernst and W. Seagle, *To the Pure*, 1929.

Census, enumeration of the inhab. of a state taken by order of its legislature. In auct Rome C. meant an authentic declaration made usually every 5 years by every Rom. citizen before 2 magistrates called censors of his own name and age, and of the name and age of his wife, together with a statement of the number of his children and slaves. The Rom. C. differed from a modern C. in respect of both its purpose and scope, its object being mainly fiscal; but it was also designed to ascertain the number of men capable of bearing arms. Taxation depended on the results of the Rom. C. Livy states that it also showed the amount of a man's debts and the names of his creditors. Rom. citizens were divided according to the valuation of their property at the C. into 6 classes, each class containing a number of centuries or hundreds. As the richer classes contained far more centuries than the poorer, it is obvious that the influence of wealth was greatly preponderant in the Comitia Centuriata, the legislative assembly of auct Rome. From the codes of Theodosius and Justinian, it appears that the scope of the Rom. C. became widened under the empire. It had become a complete register of the pop. and wealth of all the centuries included within the limits of the Caesars' dominions. Full as it was, however, it was in no sense a statistical record like a modern C., and was apparently in no way conceived to further the social progress of the people at large. The first actual enumeration of the people of England and Scotland was made in 1801. The topics of inquiry were the number of persons, the number of inhabited and uninhabited houses, and the number of families in each par. It attempted a classification of the employment of individuals under the very general divs. of agriculture, trade, manufs., and handicraft. The inquiry under this last head entirely failed, owing to the confusion engendered by the classification into families. The next C. was in 1811, and since 1801 the C. has been taken every 10 years, excepting 1941. In the C.s of 1811 and 1821 the official form of inquiry was modified so as to obtain a more accurate return of the occupation of the people. The heads of inquiry in 1841 were more numerous and minute, with the result that more accurate information was obtained. In reference to occupation, the enumerators were directed to ascertain the employment of *every* person, distinguishing sex, instead of merely, as hitherto, the employment of families and males over 20. Furthermore, the exact age of every person was ascertained, instead of quinquennial and decennial periods being taken, and the place of birth was also a subject of inquiry. The C. of 1851 was much facilitated by the system of registration of births, marriages, and deaths, which came into operation in 1837. Prior to that time the unchecked par. registers were the only available sources of information. The C. of 1851 showed a marked advance on its predecessors in regard to what may be termed social statistics. For the first time the

number of blind, deaf, and dumb persons was recorded. It also made inquiry into the eccles. and educational condition of the country by ascertaining the amount of church accommodation at the command of each denomination, and obtaining a return of the numbers of all the congregations on a particular day. This C. brought into prominence the sudden and startling decrease in the pop. of Ireland. In 1861 the C. exhibited for the first time the number of aliens and naturalised Brit. subjects in the U.K. The pop. of Ireland continued to show a decrease. The first C. of Ireland was taken in 1813, but it was not till 1821 that it was in any true sense an accurate or complete record. In 1871 the C. was extended to cover the Brit. Empire (apart from indigenous non-white races in the colonies), and since that year the mode of taking the C. has in no essentials been improved upon. The accuracy of this C. was ensured by the div. of the country into enumeration dists., with a clear indication of the various confusing local governmental or municipal sub-divs. of the kingdom. One striking feature of the C. of 1871 was that the names of persons were required, and to facilitate inquiry a separate schedule or form was sent out to each householder. Special schedules were issued for Welsh people, persons in public institutions, on board ship, and homeless or houseless persons. In regard to the last mentioned the co-operation of the metropolitan and co. police was enlisted. The comparative rate of mortality in various occupations was also inquired into by classifying the living in the different occupations or professions with regard to age. Subsequent C.s have still further widened the field of inquiry and elicited a mass of valuable information in the way of social and vital statistics; in 1901, for example, investigation was made into the evils of overcrowding by inquiries as to the number of persons occupying any particular room or part of a house. The following additions were made to the inquiries in 1911: (a) the duration of existing marriages; (b) the number of children born to such marriages; (c) the industries or services with which workers were connected, as distinct from the occupations in which they were personally engaged; (d) in the case of persons born outside England and Wales, whether they were residents or visitors in this country; (e) the number of rooms in all dwellings, instead of, as heretofore, in dwellings of less than five rooms only. In contrast to the prejudice, especially in certain eccles. quarters and among the ignorant, excited by the earlier C.s, it was noteworthy some years ago that the registrar general expected fuller and more accurate returns than ever on account of the interest evinced by the public in the C., an interest which he attributed to the aid rendered by the press; to the co-operation of the parl. committee of the Trades Union Congress; and to the efforts of elementary school-teachers who gave special C. lessons to children under their charge.

The total pop. in England and Wales was 8,892,536 in 1801; 10,164,256 in 1811; 12,000,236 in 1821; 13,896,797 in 1831; 15,914,148 in 1841; 17,927,609 in 1851; 20,066,224 in 1861; 22,712,266 in 1871; 25,974,439 in 1881; 29,002,525 in 1891; 32,527,843 in 1901; 36,070,492 in 1911; 37,886,699 in 1921; 39,952,377 in 1931; 43,757,888 in 1951. The pop. of Great Britain and Ireland a month before the beginning of the First World War was officially estimated at 46,089,249. There were over 1,000,000 more females than males in England and Wales in 1911, and, by 1921, the excess, aggravated by the losses of men in the war (about 1,000,000), was 1,736,221, and in 1931, 1,706,357. It is significant that the loss of pop. owing to emigration, which was 164,000 in 1871-81, 601,000 in 1881-91, 69,000 in 1891-1901, rose again to 501,000 in 1901-11, for it seems estab. that the number of emigrants is greatest during times of prosperity. In 1913 the total number of Brit. and N. Irish emigrants was 416,278, in 1926, 284,009, in 1930, 327,992, and in 1931, 213,057. Since then, owing to quota restrictions in the U.S.A. and Canada and elsewhere, the number has declined. Moreover, in the decade immediately following the First World War there was a steady flow of migrants to the dominions overseas, which was enhanced by schemes of state-aided migration; but during the world economic depression, 1930-3, emigration declined to its lowest point, and in 1933 less than 30,000 Brit. emigrants went to places out of Europe, while immigrants of Brit. nationality coming into Great Britain in 1932 and 1933 numbered 75,000 and 60,000 respectively.

The C. of 1911 showed a slight net gain by excess of births over deaths, a result due, however, to a relatively greater reduction in the death-rate than increase in the birth-rate. In 1924 the excess of births over deaths was 250,698; in 1933, when the trough in the birth-rate was reached, the excess was only 83,948. In the years between 1934 and 1937 the excess varied between 100,000 and 121,000; in 1938, 142,208; in 1939, 114,577; in 1940 a mere 8,583; in 1941, 43,911; and in 1942, 171,366. With the high post-war birth-rate the excess was, in 1946, 328,629; in 1947, 363,411; and in 1948, 305,408. In 1954 the excess appeared to have become stabilised at 171,755.

Cent and Centime (from Lat. *centum*, a hundred), names of coins. The cent varies in value according to the country. Thus in the U.S.A. and Canada it is a bronze coin, the hundredth part of a dollar, worth more than an Eng. penny at the 1955 rate of exchange, whilst in Holland the cent is also of bronze, and is the hundredth part of a guilder (2s.). The centime originated in France, being a hundredth part of the franc, and before the revaluation of the franc in the 1920's was equivalent to a tenth part of the Eng. penny. It was adopted in Belgium and Switzerland, and also in Italy, Greece, and Spain under different names, but to-day

it is only in circulation in Switzerland. In Spain the peseta has been divided into 100 centimos. See METROLOGY.

Cental, see METROLOGY.

Centaurea, Old World genus of Compositae of about 400 species. *C. cyanus*, the cornflower or bluebottle, grows in Britain and is cultivated for its pretty many-coloured flowers; *C. moschata*, the Sweet Sultan, and *C. montana* are garden flowers. *C. scabiosa*, the Greater Knapweed; *C. nigra*, Lesser Knapweed, or Hardheads; *C. aspera*, Rough Star Thistle; and *C. calcitrapa*, Star Thistle, occur in Britain.



CENTAUREA CYANUS: CORNFLOWER

Centaureum (synonym *Erythraea*); family Gentianaceae; family of about 30 species, chiefly annuals, cosmopolitan, except for tropical Africa. See also CENTURY.

Centaurs. According to Homer they were simply wild beasts. Later they were represented in their now more familiar guise of half man and half horse. Two legends describe them variously as the offspring of Ixion (q.v.) and a cloud, and of Ixion's son Centaurus and Nephele ('cloud'). Driven from their home on Mt Pelion in Thessaly after a celebrated fight with the Lapithae (q.v.), they inhabited the region of Pindus on the borders of Epirus. See CHIRON and HERCULES.

Centaurus, the Centaur, S. constellation, of which only a small portion can be seen in the Brit. Isles. It lies S. of Hydra and N. of Crux and was supposed to represent the centaur Chiron. Part of this constellation, which was mentioned by Aratus, lies in the Milky Way, and has sev. points of interest, not the least being that it contains Alpha Centauri, our second nearest neighbour in the stellar universe, the faint star Proxima Centauri being slightly nearer. Alpha Centauri is of the first magnitude (0.2), and the fourth brightest star. It has a very considerable proper motion, being as much as 368 in. 4 cent., and is 4½ light-years distant from

the earth. Alpha Centauri is a binary star, each revolving around the common centre of gravity in 79 years, and there is reason to believe from perturbations observed that there is also a third invisible companion. The 2 luminous stars have a probable mean distance of 2,232,000,000 n. from each other. One of them has an identical spectrum with the sun, and is thought to be of the same mass and luminosity. Its companion is about the same size, but considerably less bright. Alpha and Beta Centauri are known as the S. Pointers because they serve as a guide in finding the S. Cross, which can be used for finding the S. Pole.

Centaury, name applied to *Centaureum minus*, the common C., an ann. herb with pink flowers, and *C. portense*, the Perennial C., both natives of Britain. The Amer. C. consists of the genus *Sabbatia*, and *S. angularis* has rose-pink flowers. The composite *Centaurea* (q.v.) is also often known as C. in popular language.

Centenary (Lat. *centenarius*), to do with a hundred), celebration of an event which happened 100 years ago, especially of the births and deaths of famous men.

Centetes, typical of the family Centetidae, a small, insectivorous mammal found in Madagascar. The single species, *C. caudatus*, the tenrec, is sometimes known as the tailless hedgehog, and is distantly connected with the hedgehog within the same order. In length it is from 12 to 16 in., its teeth are 43 in number, the young have spiny hairs, and the female brings forth from 12 to 20 little ones at a birth.

Centigrade, see METROLOGY; TEMPERATURE; THERMOMETER.

Centigrade Thermometer, see THERMOMETER and THERMOMETRY.

Centimetre, see METROLOGY.

Centipede, or **Chilopoda**, order of Arthropoda in the class Myriapoda, in some respects resembling insects. The number of legs varies greatly, some species having only 15 pairs, while others have as many as 173 pairs, and the term C. is consequently misleading. The galley-worms, as they are sometimes called, have flat bodies consisting of numerous segments, all but the last two bearing a pair of legs, and the first body-segment bearing a pair of poison claws, while the head has 3 pairs of jaws and long antennae. The species are carnivorous, killing their prey with their poison-claws, which in some tropical representatives are able to inflict dangerous wounds upon man. They are creatures of night, light seeming to have little effect on them, as some are utterly devoid of sight and only one family has compound eyes. They lurk beneath stones or in houses, and at night attack small animals. The genera *Lithobius*, *Scotopendra*, and *Geophilus* are known to Britain; *L. forficatus* is our most common species; *S. gigas* a large tropical C., which attains a length of 12 in.; and *G. electricus* glows in the dark.

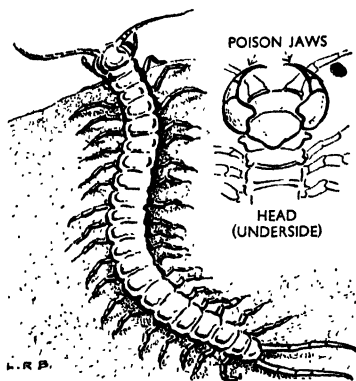
Centlivre, **Susannah** (c. 1667-1723), actress and dramatist, b. probably in Ireland, her maiden name being Freeman. As her third husband she married in 1706

Joseph C., chef to Queen Anne. She wrote about a score of plays, which are well constructed and amusing, among the best being *The Perjured Husband*, 1700, *The Gamester*, 1705, *Love at a Venture*, 1706, *The Busybody*, 1709, and *A Bold Stroke for a Wife*, 1718.

Cento, It. tn, in Emilia-Romagna (q.v.), on the Reno, 19 m. SW. of Ferrara (q.v.). It has an anct castle and sev. other fine old buildings. Francesco Barbieri (see GUERCINO) was b. here. Pop. 4500.

Cento (Gk *kentrōn*; Lat. *cento*, patch-work), composition put together out of passages borrowed from other writings. The manuf. of such artificial works was a favourite literary exercise of the Romans in the early cents. AD, as later of the medieval monks. Virgil's *Aeneid* was especially subjected to this treatment. Thus on it were based both Ausonius's rapid survey of biblical hist. (4th cent. AD) and Capitulus's attack on the immorality and luxury of monasteries (1535). The Empress Eudoxia succeeded in stringing together a life of Christ from the Homeric poems.

Centorbe, see CENTURPIE.



CENTIPEDE

Central America, geographical div. extending from the isthmus of Tehuantepec to the isthmus of Panama. Mt ranges traverse this portion of America from end to end. The Sierra Madre is the prin. range, which runs across Guatemala, and the highest point reaches close on 10,000 ft. These mts extend S. into Nicaragua. The large volcanoes of Mexico and C. A. are situated on the Pacific side, and form a cordillera. These rise to great heights, as in Acatenango in Guatemala (12,800 ft) and Irazú (11,500 ft) situated in Costa Rica. The amount of deposit from the volcanoes is very great, and covers a wide area. In some places this deposit has entirely blocked up the original structure of the country. Eruptions began in the Cretaceous period, and continue at the present time. The

rocks are composed of lava and ashes, mostly andesitic and basaltic. Owing to the greatest elevation being on the Pacific side, the rivs. are shorter than on the Atlantic side. The prin. riv. is the Usumacinta, on the E. side, which is more than 600 m. long from its mouth to the Río de la Pasión. The average temp. on the low coast lands is from 80° to 73° F., and in those lands lying from 2000 to 5000 ft above sea level the temp. is 73° to 63° F. Above this altitude frosts occur. The rainfall is exceptionally heavy on the Atlantic side, as much as 180 in. falling in the year in Alta Verapaz, Guatemala, while El Salvador has only 54 in. A more striking contrast exists between Greytown, with a rainfall of 244 in., and Rivas with 69 in. The flora ranges from Alpine to tropical. With regard to the forests, they are inferior in size to those found in the lats. in the E. hemisphere, but they are far more beautiful and luxuriant. In the volcanic regions the soil is extremely fertile, and yields in consequence splendid crops of rice, coffee, cocoa, and maize. The fruits grown are bananas, yams, pineapples, guavas, and citrons, while arrowroot, beans, and tomatoes are largely cultivated. The woods found there are mahogany, cedar, logwood, and Brazil wood; cocoa palms and mangroves also grow in this country. Of fibrous plants which grow in the region winter's bark, sarsaparilla, vanilla, and indiarubber may be mentioned. Numerous beautiful orchids and flowers are peculiar to this country. With regard to the animals, these are as varied as the plants, but owing to the region being comparatively small, there are very few species that can claim to be peculiar to C. A. Pumas, jaguars, tapirs, monkeys, alligators, venomous snakes, vultures, and birds of brilliant plumage are found in large numbers. There are as many as 260 species of birds, many of which are found only in this part of the world. Bats are so numerous that in some parts they have amounted to a plague, and whole vills. have been left deserted owing to the overwhelming swarms of these creatures. Insects are also present in large numbers, and are of the troublesome kind. The natives once consisted of the Maya Indians of the N., and there were smaller tribes in other parts of the country. At present the pure-bred Indian is mostly found in Guatemala and Yucatan, and only to a much smaller extent in other states. The greater part of the pop. is made up of half-breeds, but in Costa Rica Sp. people predominate. Scattered over the country may be found many very interesting remains, the prin. being the ruins of Palenque in Tabasco, Uxmal in Yucatan, Santa Lucia in Guatemala, and Copán in Honduras. C. A. is divided into reps. named as follows: Guatemala, Honduras, Salvador, Nicaragua, Costa Rica, and Panama (qq.v.). Brit. Honduras (q.v.) is a crown colony belonging to Great Britain. The provs. of Chiapas, Tabasco, and Yucatan all form part of the Mexican rep. See T. A. Joyce, *Central America*

and West Indian Archaeology, 1916; T. Gann, *Discoveries and Adventures in Central America*, 1928; H. G. Miller, *The Isthmian Highway*, 1929; W. W. Von Hagen, *Maya Explorer*, 1947; S. de Madariaga, *The Rise of the Spanish American Empire*, 1947, and *The Fall of the Spanish American Empire*, 1948; W. Beebe, *Book of Bays*, 1948; W. C. Gordon, *Economy of Latin America*, 1950.

Central Asia (Soviet) is nearly all comprised in the former prov. of W. Turkestan. There is some confusion over the precise delimitations of the great extent of country comprised under the old name of Russian or W. Turkestan—a ter. covering 1,534,000 sq. m., and supporting a pop. of over 16,000,000. Politically Soviet C. A. comprises Uzbekistan (q.v.), on the frontier of Afghanistan, in the foothills of the Tien Shan and Pamir Mts; Turkmenia (q.v.), situated on the frontiers of Persia and Afghanistan, stretching from the Caspian Sea to the Amu-Darya R.; Tajikistan (q.v.), which lies on the frontier of Afghanistan and W. China; and Kirgizia, also bordering W. China, Kazakhstan (q.v.), on the frontier of Sinkiang and stretching from the lower reaches of the Volga to the Altai, and from the mts of the Tien Shan to the Trans-Siberian railway, is a separate area according to Soviet classification, but is often regarded as C. A. by the W. Up to the revolution of 1917, Russian C. A. was divided politically into the khanate of Khiva, the governor-generalship of Turkestan, and the emirate of Bukhara; but after the revolution the Soviet Gov. abolished the governor-generalship of Turkestan (1920) and set up a Soviet rep. in its place. Following a redistribution in 1924 of all these ters., the new autonomous reps. of Uzbekistan, Turkmenia, and Tajikistan were estab. advancing in 1929 to the status of Union reps. The name Kirgiz Autonomous Oblast was first given to the present Kirgizia in 1925 and Kirgizia became a S.S.R. in 1936. The Uzbek S.S.R. now includes the Kara-Kalpak Autonomous S.S.R. On the N. Soviet C. A. is bounded by Siberia, on the W. by the Caspian Sea, on the S. by Persia, Afghanistan, and India, and on the E. by Sinkiang and Mongolia. There is a very sharp physical div. between the mountainous country to the E. and the deserts and steppes to the W. and N. The highlands are part of the orographical flange which skirts the NW. border of the great tableland of C. A., and runs in a direction SW. to NE. The great border chains of the S. Tien Shan consist of the Alai Tau, Trans-Ili, Kunghei Alai Tau, Kokshal Tau, and Trans-Alai, etc., whilst many ranges, including the Chigiz Tau, Kandy Tau, Ferghana, Nura Tau Mts, etc., shoot off from these border chains in various directions. In both systems the heights of individual peaks vary from 10,000 to 20,000 ft. and Mt Stalin attains an altitude of 24,590 ft. In this region, to the E. of the Academy range, is the Fedchenko glacier, 50 m. in length, and (excepting the Arctic) the largest in the world; whilst perpetual snow covers many

summits. Deep depressions such as the 'Dzungar Gates,' Issykkul, etc., between the ridges spreading out westward have from time immemorial served as passes to the W. from the great central plateau. But the mean elevation of the passes is over 10,000 ft. The highlands are girdled by a belt of plains, known as the Balkash plains, whose average elevation is some 1250 ft, which in their turn are surrounded by the Aral-Caspian Depression—a great stretch of lowland occupying two-thirds of the whole prov., the altitude of which is rarely greater than 400 ft, sinking sometimes to below sea level. The Kara Tau Mts separating the Syr-Darya and Chu R.s are considered the line of demarcation. The higher girde of plateau land, which is well drained by the Balkash, Ala-kul, Ili, and other rivs. which flow into Lake Balkash, supports the countless herds and flocks of the Kirgiz. The Akkum steppe, with its wide expanse of shifting sands, encircles Lake Karakul. The lower and outer belt of plains belonging to the Turanian basin is watered by the Amu and Syr, which alone succeed in bridging the desert as far as the Aral Sea. The Murgab and Tedzhen dry up in the heart of the Kara Kum desert, whilst the Zeravshan gets no further than the gardens of Bukhara. In these plains the dividing line between oases and desert is very clearly defined. Continuous fertile soil is found only at the base of the mts. The physical features of the country are perpetually changing. Hot desert winds are continually parching the numerous lakes; the sea of Aral, or the 'Blue Sea,' now fills only a fraction of its former basin; prosperous regions, where ancient civilisations flourished in Bukhara, Bactria, and Samarkand, have been swept away through the desiccation of riv. channels which were once their main arteries. The climate is continental, its salient feature being the scarcity of rain. Thus though precipitation is plentiful on the highlands, it is reduced to 11 in. at Tashkent, and is almost zero over the Transcaspien steppes. The ann. variations in temp. are very considerable. Thus, whilst in Jan. the thermometer falls usually below freezing-point, and has been known to register 10° F., a temp. of 100° F. in the shade and more is not uncommon in the summertime. Reflection from an arid soil aggravates the discomfort caused by the heat. The fauna include the Himalayan bear, marmot, badger, lynx, tiger, jackal, fox, wolf, antelope, zebu, hedgehog, etc.

Wild horses and camels are found, whilst the splendid *Ovis poli* abounds on the Pamir tableland. There are some 400 different species of birds, whilst the variety of insect fauna is almost countless. Arboreal vegetation is rare. Poplars, ash, juniper, maples, and pines occur, whilst apple and apricot orchards flourish on the lower mt slopes.

In the 4 reps. vast deserts have forced the pop. to the oases and irrigated lands. The largest area of cultivation is around Tashkent in the sheltered Fergana valley; cotton and sugar-beet are the chief

crops. Other fertile areas lie by Samarkand, and in the extreme S. near Tedzhen, Merv, and Stalinabad. Here, as on all the oases, cotton is the chief crop, and that, increasingly, of the Egyptian variety. Irrigation in the Vakhsh valley in Tajikistan has rendered 100,000 ac. of land capable of producing cotton crops. There is also some orchard cultivation, and a considerable co-operative silk industry. Mechanisation and the collective and state farm form of agriculture have been introduced. Merino and Astrakhan sheep are bred in Uzbekistan and Kirgizia; in the latter horse-breeding is also an important occupation. Industry is keyed to products of the central Asiatic countries. Local cotton and silk production has built a large textile industry; vegetable oil is manuf. from cotton seed; and textile and agric. machinery is made at Tashkent. There are large chemical plants at Kara Bogaz on the Caspian Sea and in the middle of the Kara Kum desert, which provide fertilisers. Coal is mined in Kirgizia and Uzbekistan, and there are oil wells at Nebit Dag on the Caspian, near Bukhara, and in the Fergana valley. Of the cities, Tashkent is the largest of C. A. with a pop. of 615,000; Samarkand (165,000) was once Tamerlane's cap.; Ashkhabad (120,000), cap. of Turkmenia, is the terminus of the Asiatic railway. Bukhara (60,000) is an ant. city, noted for its handicrafts; Frunze (155,000) is the cap. of Kirgizia, and Stalinabad (150,000) of Tajikistan. These and other cities possess many mosques, old buildings, mud walls, and relics of the ant. feudal states close to the 20th-cent. factories and flats. The descendants of the old Iranian dwellers in the S. reps. of C. A. are the Tajiks who now form about 14 per cent of the pop. The later invaders of the land, the Uzbeks, Turkmens, and Kirgiz, have remained; one-half of the whole pop. are of Uzbek stock. Pop.: Turkmenia, 1,170,000; Uzbekistan, 6,360,000; Tajikistan, 1,460,000; and Kirgizia, 1,600,000. See A. E. Voeklov, *Le Turkestan russe*, 1914; E. Mannin, *South to Samarkand*, 1936; E. K. Maillart, *Turkestan Solo*, 1938; E. S. Bates, *Soviet Asia*, 1942; J. S. Gregory and D. W. Shave, *The U.S.S.R.: a Geographical Survey*, 1944.

Central Asian Society, Royal, founded in 1901 to provide up-to-date information on current affairs, problems, etc., of Central Asia and the Middle E. Lectures twice monthly cover recent events and trends. Papers and reports of lectures are pub. in the quarterly jour. of the society.

Central Australia, now part of the N. Ter., which under the provisions of the Northern Australia Act of 1926 was divided into 2 areas, N. Australia and C. A., which were separated by the twentieth parallel of S. lat. C. A. was administered by a governor resident assisted by an Advisory Council. This Act was repealed in 1931 when the whole of the ter. was reconstituted as an administrative entity, with Darwin as the seat of the

administration. See also ALICE SPRINGS and NORTHERN TERRITORY.

Central Criminal Court, Old Bailey (q.v.), London, estab. in 1834 for the trial of treasons, murders, and other felonies and misdemeanours committed within the city of London and co. of Middlesex, and in certain specified parts of the cos. of Essex, Kent, and Surrey. Generally speaking the jurisdiction of the C. C. C. is similar to that of the criminal side of the assizes, and its judges or commissioners, like the assize or circuit judges, sit by virtue of commissions of oyer and terminer and jail delivery. The judges of the C. C. C. comprise the lord chancellor, who, however, never sits there, the judges of the high court, the recorder and common serjeant of London, together with the lord mayor and aldermen of the city of London, and such other persons as the Crown may appoint. In practice the recorder and common serjeant sit on the first 2 days of each session, after which one or more high court judges comes down to try the more serious cases. The court is held at least 12 times a year, and more often if necessity arises. The dates of the sessions are fixed annually at a conference of the judges. The C. C. C., like the assize justices, has the power to try all offences committed on the high seas or within the jurisdiction of the Admiralty. The Admiralty jurisdiction extends over the territorial waters of the Brit. dominions, i.e. to a distance of 3 m. from low-water mark; but in the case of crimes committed on Brit. ships its jurisdiction extends not only over the high seas but also up foreign rivers, 'as far as great ships go.' The C. C. C. also tries cases sent to it by queen's bench div. It has, too, a transferred jurisdiction in cases removed to it from the various sessions of the peace within its dist.

Central Electricity Authority. Following on the passing of the Electricity Re-organisation Act, 1954, the Brit. Electricity Authority (q.v.) became the C. E. A., having 11 generation divs., responsible for generation of electricity and bulk supply to the 12 area electricity boards in England and Wales, and also for exercising a general control over the policy of these boards. The C. E. A. is appointed by and responsible to the Minister of Fuel and Power, and the electricity which it supplies is bought by the area boards for distribution and sale to consumers in their respective areas. In each board's ter. there is a consultative council representing the interests of local authorities and consumers. The supply system of the C. E. A. is based on 274 generating stations, with plant of a total capacity of 22,000,000 kw., producing over 63,000,000,000 units a year.

Central Electricity Board, see BRITISH ELECTRICITY AUTHORITY.

Central Falls, manufacturing city in Providence co., Rhode Is., U.S.A., on Blackstone R. and New York, New Haven, and Hartford railway, 6 m. N. of Providence. It manufs. textiles, glassware; paper, leather, and wood products; plastics, toys, chemicals, and machinery; there

is also a boat-building industry. Pop 23,550.

Central Force, force which tends to produce acceleration towards a centre of focus (see CENTRIPETAL FORCE).

The conception of C. F. has a special importance in the history of astronomical research (see ASTRONOMY; GRAVITATION KEPLER).

Central Provinces and Berar, see MADHYA PRADESH.

Centralisation, system of concentrating administrative functions in the hands of the prin. depts of the State. In political science it is the exact opposite of *laissez-faire* (q.v.). The irreducible minimum of the functions of the State, which, according to Herbert Spencer, comprises the duty of keeping order within the ter. of the State, and of defending its borders from external aggression, has in more recent times become so expanded that much that was formerly left to the discretion of local governing bodies has been transferred to State depts. With the remarkable increase in municipal trading in England, the introduction of so much legislation on the lines of social reform, and the great activity in matters appertaining to public health, the functions of such depts as the Home Office, the Board of Trade, and the Ministry of Health have necessarily become even more comprehensive. C. secures uniformity in institutions, and what may appear to be encroachments by the State may amount to an enlightened conception of the obligation to preserve internal order. Yet the growth of C. has brought dangers to democratic gov., local initiative, and personal liberty. See CLASSICAL ECONOMISTS.

Centranthus, see KENTRANTHUS.

Centrarchidae, or **Sunfishes**, family of perch-like fishes which inhabit fresh water of N. America. The species, of which about 30 are known, are compressed and somewhat oval in body and have a spot on the operculum. Most of them build nests, all are voracious, and many are valued as food. The genus *Micropterus*, which comprises the black bass, is found in Europe.

Centre, point which is equidistant from all points on the bounding lines or surfaces of a figure. Such a fixed point can only exist in a circle or a sphere, and the equal lines which may be drawn from the C. to the boundary are called radii. Irregular figures and solids, however, have a fixed point which is called a centroid (q.v.), or C. of mass, generally known as the C. of gravity. This point is such that the moment of the whole figure in any plane is the same as if the whole mass were collected at that point. If a figure is so regular that circles may be described within and without touching different points at regular intervals, the C. of such circles is often referred to as the C. of the figure.

Centre, Canal du, canal in the dept of Saône-et-Loire, France, joining the Saône and Loire. The canal is 75 m. long, stretching from Chalon-sur-Saône to Digoin, and serves the industrial region

of Le Creusot and Montceau-les-Mines. It was constructed in 1781.

Centre-board, nautical device used to prevent a boat making too much lee-way by offering greater oblique resistance to the current. The device is used in small speed-boats, yachts, and other racing skiffs. The board consists of a movable keel which swings on a pivot, and is lowered at pleasure through a slot in the bottom of the boat. Vessels with wall sides can acquire keel depth by means of a lee-board.

Centre of Gravity, or **Centre of Mass**, fixed point in a body through which the resultant of the gravity forces acting on all the molecules of the body may be said to act. From the earliest times it had been vaguely recognised that an attraction existed between all material particles, but it was Newton who estab. the fact that the tendency of bodies to fall to the surface of the earth was part of the law of universal attraction. Owing to the great mass of the earth, it is extremely difficult to demonstrate on the earth's surface the existence of any gravitational force other than that in which the mass of the earth is an overwhelming factor. Every particle, therefore, tends to fall in a direction which we call *vertical*, that is, towards the earth's C. of G. The vertical line at any point of the globe may be determined by the use of the plumb-line, which consists of a weight attached to the end of a string. A force acts upon every particle composing a body in a vertical direction; the directions of all the forces on all the particles will, therefore, be parallel, and a point can be found through which the same effect can be produced by a force equal to the sum of all the individual forces. This point is called the C. of G. In the case of a sphere or circle, the C. of G. is the geometrical centre, in a cylinder it is the middle point of the axis, in a triangle it is situated on the line which joins the vertex (q.v.) to the middle point of the opposite side and at a distance from the vertex equal to two-thirds of that line; in each of these cases it must be supposed that the material is equally dense throughout. To determine the C. of G. of a body experimentally, it should be suspended from one point and allowed to hang freely; the C. of G. must then be in the vertical line passing through the point of suspension, otherwise the body would rotate by reason of a greater force acting on one side. By choosing another point of suspension a second vertical line may be estab. in which the C. of G. is situated, and the point of intersection of these 2 lines will give the required centre. As the action of gravity can be reduced to a single vertical force acting at a single point, equilibrium (q.v.) depends on the relative positions of this point and the points at which a body is supported. If the body is supported at one point only, that point requires to be in the same vertical line as the C. of G. to establish equilibrium. If the body is supported on or from a number of points, the vertical line from the C. of G. requires to fall

within the figure traced out by joining those points by straight lines. The broader the base, therefore, the more *stable* is the equilibrium, for the body may be tilted to a greater extent without bringing the line of gravity outside the base; so that the body when released simply resumes its former position. A body is said to be in *unstable* equilibrium when the slightest disturbance of position results in its toppling over, such as a stick balanced on the finger; in this case the vertical line through the C. of G. does not pass through the point of support if the stick is moved. If a body is moved to an adjacent position and still remains in equilibrium it is said to be *neutral* equilibrium—a sphere on a plane is an example; however it is moved, the C. of G. is always vertically above the point of support. See CENTROID.

Centre of Gyration, that point in a rotating body at which the total mass of the body may be supposed to be concentrated. Gyration is rotation about a fixed line, called the axis of gyration, and the inertia of the body acts as a resistance to any change in the angular velocity of the body with regard to the axis of gyration. The resistance depends upon the distribution of the mass, and it is possible to conceive of the whole mass being located at a single point so that the resistance is unaltered.

Centre of Mass, see CENTRE OF GRAVITY.

Centre of Oscillation, that point in a suspended body at which the whole mass of the body may be looked upon as concentrated in order that the time of oscillation for small displacements may be the same. An ideal simple pendulum consists of a heavy particle suspended by a weightless rigid thread from a fixed point, about which it oscillates. Such a pendulum does not exist in practice, and it is usually convenient to use a rigid rod terminated by a heavy mass. The different points in this system will strive to complete their oscillations in different times, owing to their varying distances from the point of suspension. They must, however, all oscillate together; and it follows that the motion of particles near the point of suspension will be retarded, while that of the more distant particles will be accelerated. Between these points it will be possible to fix upon a point where the motion is neither accelerated nor retarded, and the distance of this C. of O. from the point of suspension is the length of the pendulum. It has been found that the point of suspension and the C. of O. are mutually convertible, so that the C. of O. may be found experimentally as that point at which the pendulum must be suspended in order to produce the same time of oscillation as when the pendulum was suspended at its first point of suspension.

Centre of Percussion. If a body capable of rotating about a fixed axis receives a blow that starts it rotating round that axis *but without causing any impulsive pressure on it*, the point in which the plane containing the fixed axis and the centre of inertia of the body is met by

the direction of the blow, is called the C. of P. of the body. The 2 points, the C. of P. and the centre of rotation, are mutually convertible, and in fact stand in the same relation as the centre of oscillation and the point of suspension of the body considered as a pendulum. A cricket bat swung to meet a ball at its C. of P. does not communicate any shock to the hand, regarded as the axis, by reason of the impact, but a shock is felt if the obstacle is met at a greater or smaller distance.

Centre of Pressure, that point in a surface pressed by a fluid at which the whole pressure exerted by the fluid may be counteracted by a single force equal to the impressed force. If a plane surface is immersed horizontally, the C. of P. corresponds with the centre of gravity, but not if it is immersed in any other direction. If a rectangle be immersed vertically with one side in the surface, the C. of P. is at a distance of two-thirds of the vertical side below the surface. The term is used with reference to plane surfaces only, since it is not always possible to represent the pressures on a curved surface by a single force. The resultant pressure on a plane area immersed in a fluid is equal to the product of the area and the pressure at the centroid. See HYDROSTATICS.

Centrifugal Force, see CENTRIFUGAL FORCE.

Centering, or Centering. When arches are being made it is necessary to support them in order that they shall not come to pieces before the mortar is set and equilibrium obtained. This is done by making a framework of wood called a centre of the required curve along its upper edge, upon which the brick or stone can rest and be built up. In the case of arches of small rise, such as those above a window, the centre can be shaped from a single board or 2 boards, which are held in position by means of supports nailed into the jambs of the opening. This can only be done if the soffit is of small thickness: for larger ones a semicircular frame is made with strips crossing the top. For larger arches with a big rise a complicated structure of wooden pieces must be built up to the required shape and of such a form that stresses in the members are of safe values when the load is applied. The removal of the centre is done gradually so as to let the arch take up its proper form (see ARCH). In reinforced concrete construction, similar support is required for floors, beams, columns, etc., during erection, until the concrete has set hard. This is generally made of adjustable metal tubing, and is called 'farmwork.'

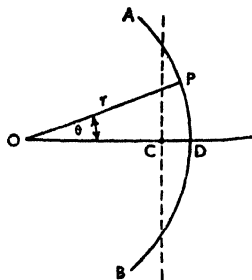
Centripetal Force is the force that must be applied to a body to cause it to move with uniform speed in a circular path. According to Newton's first law a body will continue to move with a constant velocity in a straight line unless acted upon by external forces. If we wish the body to take up a circular path, a force must be applied perpendicular to the direction of motion and equal in magnitude to the product of the mass into the square of the velocity divided by the

radius of the circle, $F = mv^2/r$. The direction of the force is towards the centre of the circle and is known as a C. F. The motion of the body when the force is removed will be along the tangent to the circle at the point where the body leaves it. By analogy to the conditions for equilibrium in statics it is usually, but strictly speaking incorrectly, assumed that a body moving in a circle is held in 'equilibrium' by 2 equal and opposite forces. One is clearly the C. F. acting towards the centre of the circle and the other is known as the centrifugal force. It is usually said to act on the body away from the centre, but is in fact simply the tendency of any body to travel in a straight line. The centrifugal force on a body is proportional to its mass, ($F = \frac{mv^2}{r}$)

so that dense bodies will tend to move to the outer radius of a cylindrical vessel rotating about its axis, and lighter substances are displaced towards the axis. In the design of flywheels, and all rapidly rotating wheels, the centrifugal force is an important consideration. With heavy rims moving at high velocities the force becomes enormous, and if the tensile strength of the metal does not exceed the tension caused by the force, the wheel may fly to pieces with dangerous consequences. Centrifugal force lies behind the action of various machines, e.g. 'spin driers' (see DRYING MACHINES), milk separators (see DAIRY), and speed regulators (see STEAM, Governor).

Centiscus, the shrimp-fish, a genus of the teleost order *Solenichthyes*, which includes the pipe-fishes and sea-horses. The body is encased in a thin, bony armour with a knife-like lower edge. *C.* is found in the Indian and Pacific oceans.

Centroid, the point in a geometrical figure having co-ordinates which are the mean values of the co-ordinates of all the points of the figure. The C. corresponds to the centre of gravity (q.v.) of a material body of similar form and uniform density.



As an example of how the C. is found, consider the case of a circular arc of uniform thickness and line density. In the figure ADB is the arc of radius r , D its mid-point, O the centre of the circle, and P is any point on the arc such that $POD = \theta$. The C. clearly lies on the line OD. Let it be at C so that $OC = \bar{x}$.

Then the sum of the moments of all the small elements of the arc of length $r.d\theta$ about the line through C. parallel to the y -axis must be zero, i.e. the arc would balance on a knife-edge placed under C. If the x -co-ordinate of P is x , the moment of the small element is $r.d\theta \cdot (\bar{x} - x)$, and we have $2r.d\theta \cdot (\bar{x} - x) = 0$, where the sum is taken from A to B , i.e. from $\theta = \alpha$ to $-\alpha$, where $\alpha = DOA$. Therefore,

$$\int_{-\alpha}^{\alpha} r \cdot \bar{x} \cdot d\theta - \int_{-\alpha}^{\alpha} r \cdot x \cdot d\theta = 0$$

and since $x = r \cdot \cos \theta$,

$$r \cdot \bar{x} \cdot (2\alpha) - \int_{-\alpha}^{\alpha} r^2 \cos \theta \cdot d\theta = 0$$

or $2r \cdot \bar{x} \cdot \alpha = r^2 [\sin \alpha - \sin(-\alpha)]$

therefore $\bar{x} = r \cdot \sin \alpha / \alpha$.

Thus the position of C. is determined. For a semicircle, $\alpha = \pi/2$, $\sin \alpha = 1$ and therefore $\bar{x} = 2r/\pi$. For a circle $\alpha = 2\pi$, $\sin \alpha = 0$ and therefore $\bar{x} = 0$, i.e. the C. is at the centre, as may be expected. Other figures can be treated in a similar manner.

Centrolophus, genus of oceanic fishes of the family *Stromateidae* and order *Percomorphi*. *C. niger*, the black fish, has occasionally been found on Brit. coasts.

Centronotus, or *Pholis*, genus of spiny-rayed fishes of the *Blenniidae*, or blenny family. The species are littoral, and *C. gunnelius*, the butter-fish, is British.

Centropomus, genus of perch-like fish of the family *Centropomidae*. *C. undecimalis*, the sea-pike, which tenants the mouths of great rivers of S. America, weighs about 25 lb., and is used largely for food.

Centropristis, genus of spiny-rayed fish, of which sev. species appear on the coasts and in the rivers of America. *C. nigricans*, the black perch or black bass, is abundant in N. Amer. rivers, and is much esteemed for the table.

Centumviri, court of civil jurisdiction in ancient Rome, the number of which varied from 105 to 180. Sometimes the court sat as a whole body under the presidency of a praetor, but on occasions it sat in sections (*consilia*). Their jurisdiction extended in the first place to matters of status and quiritian ownership, but was later confined mostly to questions of succession. The special sign of quiritian ownership was the spear, which was always erected in front of their court.

Centunculus, genus of 3 ann. species of *Primulaceae* which flourishes in temperate and sub-tropical countries. In Britain it has one native species, *C. minimus*, the bastard pimpernel, or chaff-weed, a small plant with pink flowers.

Centurion, see ROMAN ARMY.

Centuripe (formerly *Centorbe*; anct *Centuripae*), tn in Sicily (q.v.), on a hill 26 m. ENE. of Enna (q.v.). In anct times it was one of the most important tns of the Siculi (see SICILY, History; and see CICERO, Verr. (2nd oration), iii, iv, and v, *passim*, and Plin. iii. c. 8). In 1233 the

tn was sacked by the Emperor Frederick II (q.v.). It suffered some damage during the Second World War. There are sulphur mines and marble quarries in the vicinity. Pop. 11,000.

Cenydd (Kenneth, Fr. Kinède), St. 6th cent. Celt. said to have been born a cripple and fed on doe's milk out of a bell. He was trained in monasticism by Sts Illtyd and Cadoc, and St David put him over his foundation in Gower, where later he founded his own monastery at Llan-gennith. He was married, and one of his sons was St Ffili (whence the place-names Kervill, Caerphilly, Rhosilly). He followed his father (St Gildas Badonicus), with his family, c. 544, to Brittany, where he is venerated (e.g. at Ploumeln and Plaintell). See S. Baring-Gould and J. Fisher, *Lives of the British Saints*, 1908.

Churl, O.E. word used to denote a 'churl' or freeman who held the position above a serf, but below the noble or thegn. The economic position of the C. was precarious; occasionally he could rise to the rank of thegn, but more often through stress of circumstances he became identified with the serf, and the latter process had become the general rule by the time of the Norman Conquest.

Ceos, now called *Cea*, or *Zea*, an is. of the Cyclades group in the Aegean Sea. It is 10½ m. long by 6 m. wide and has an area of about 40 sq. m. It has a moist climate and is more fertile than most of the Gk is. Spring water is plentiful. There are forests of Valona oak from which tanning bark is obtained. Grain and fruit are grown. C. is the bp. of the poet Simonides. Pop. 3700.

Cephaelis, now sometimes included in the genus *Craoge*, belongs to the family Rubiaceae and flourishes in S. America. *C.* (or *U.*) *ipacacantha*, which grows in damp, shaded parts of Brazilian forests, is a herb from the roots of which the drug ipacacantha is obtained.

Cephaloematoma, term used in medicine to denote a tumour or swelling due to the extravasation of blood beneath the pericranium. It is only observed in new-born infants, and is produced by pressure during labour, which causes a tearing of the periosteal tissues. There is no need in most cases to do anything with a swelling of this kind, as absorption generally occurs and the C. disappears.

Cephalanthera, genus of N. Orchidaceae, of which 3 species (helleborines) are British. *C. damasonium*, *C. rubra*, and *C. longifolia* are all leafy plants with rhizomes, a rudimentary rostellum, and an unspurred labellum.

Cephalanthus, genus of Rubiaceae common to Asia, Africa, and America. *C. occidentalis*, the button-wood, is a shrub which grows to a height of 6 to 15 ft. and has a light spongy wood. The root contains an agreeable bitter used as a remedy for coughs.

Cephalaspids, members of the order Osteostraci of the jawless ostracoderms (q.v.). They are abundant in rocks of late Silurian and Lower Devonian age. They have fish-like bodies, with dorsal fins and a heterocercal tail. The large

head is covered with a bony shield bearing electric fields, and the flat ventral surface and dorsal eyes suggest a bottom-dwelling mode of life. There are paired pectoral fins, and the scales of the body are arranged in vertical rows. There are 10 pairs of gill cavities, and an ossified cranial skeleton is present. The anatomy of the soft parts such as brain, nerves, and blood vessels is known in considerable detail.

Cephalocarida, a subclass of Crustacea. *Hutchinsoniella macracantha*, the only representative of this group, was discovered in Long Island Sound in 1954. This is a small (about one-tenth of an inch long) elongated crustacean with a horseshoe-shaped head and 19 succeeding segments of which the first 8 bear biramous limbs. Segments 11 to 18 lack appendages. The head is produced backward as a short carapace. *Hutchinsoniella* is regarded as an extremely primitive crustacean.

Cephalochordata, class of protochordate animals called lancelets. They are slender, transparent, fish-shaped creatures with a stiffening rod or notochord running along the back from one end of the animal to the other. See also AMPHIOXUS.

Cephalodiscus, curious animal about the classification of which there has been some disputation among zoologists. It was first discovered in 1876, when the members of the *Challenger* expedition were dredging in the Strait of Magellan, but later it was found in sev. other seas. It was originally believed to be related to the Polyzoa, but is now classed with *Balanoglossus*, and *Rhabdopleura* and has been placed among the protochordate animals. The C. is colonial, and lives with other individuals in a branching, weed-like investment which may measure as much as 9 in. by 6. The body, like that of *Balanoglossus*, is divided into a proboscis, collar, and trunk; 2 gill-slits may be present and a notochord may be represented by a diverticulum of the alimentary cannal. All these animals comprise the Hemichordata, allied to the Cephalochordata (q.v.).

Cephaloedum, see CEPALU.

Cephalonia, or **Kephalenia**, place mentioned in the *Odyssey* under the name of Samos (Same). It is the name given to the largest of the 7 Ionian Isles lying to the W. of Greece and opposite the entrance to the Gulf of Patras. It is 31 m. long, up to 22 m. across and has an area of 277 sq. m. The coastline is very broken, and the surface is mountainous. The highest point is Elato, or Monte Negro (anc. Gk *Ainos*; Lat. *Aenos*) 5315 ft.). The vine and currant are grown extensively, and wheat, oil, and fruit are the chief exports. The chief tn is Argostoli. Pop. 47,300.

Cephalopoda (Gk *kephale*, head; *pous*, foot), to which belong the octopods, cuttlefishes, and squids, are the most highly specialised molluscs, and are characterised by the well-marked head, round which are arranged symmetrically arms bearing suckers or tentacles,

formed from the foot, as is the funnel through which water is squirted. The mantle-cavity contains 4 ctenidia (gills) in the Tetrabranchiata, 2 in the Dibranchiata, and in both orders the median anus, ink-sac, paired kidneys, and genital duct open into it. The eyes are very large, those of one species measuring 15 in. across; the mouth has a parrot-like beak and on the tongue there is a rasping ribbon; the sense of touch is highly specialised in the arms. The cephalopods are all marine, voracious animals which feed on animal matter, especially on Crustacea; they can swim in a horizontal position or creep by means of their arms,



CEPHALOPODA: COMMON OCTOPUS

and they project themselves backward swiftly by a contraction of the mantle. The ink-sac is a gland which opens into the rectum, and contains a dark brown fluid in which is sepia; when alarmed the creature can expel this fluid and darken the surrounding water so as to cover its disappearance by a kind of 'smoke screen.' Among the C. the sexes are always distinct, a characteristic not common among molluscs, and the female is usually larger than the male. The eggs are large and are attached in masses, called sea-grapes, to bodies in the sea, and immediately on hatching they present the appearance of a diminutive adult. The C. are divided into 2 orders, the Tetrabranchiata and Dibranchiata, according to the number of their gills. In the former order there are 4, and the species are characterised by having no ink-sac, a well-developed external shell, a funnel composed of 2 unfused lobes, 4 kidneys and auricles, and numerous arms without suckers. *Nautilus* is the single living genus of this order, but sev. are found fossil, the commonest being *Ammonites*. The Dibranchiata have 2 gills, and the species are usually furnished with an ink-sac; there is no external shell, the lobes of the funnel are fused, the kidneys and auricles are 2 in number, and there are either 8 or 10 sucker-bearing arms. When

there are 8 arms and 2 tentacular arms these molluscs are known as Decapoda, and have an internal shell, e.g. fossil *Belemnites*, or the living *Sepia*, the cuttlefish (of which the internal shell, or cuttlefish 'bone' is sometimes suspended in parrot cages); when there are only 8 arms, the creatures are Octopoda and have no shell, e.g. *Octopus*, the poulpe or octopus, and *Argonauta*, the paper-nautilus. The reproduction of C. is remarkable in that one of the arms of the male becomes charged with sperm and is used as a copulatory organ; in some species (e.g. the Argonaut) this arm is much modified ('hectocotylised') and is left behind in the body of the female, where it was described by Cuvier as a parasite. Some deep-sea species of C. are enormous in size, being amongst the largest of known animals. *Architeuthis*, the giant squid, attains a length of 50 ft or more.

Cephalotaceae, dicotyledonous family of a single genus consisting of one species, *Cephalotus follicularis*. This plant, popularly known as New Holland pitcher plant, grows in the marshes of W. Australia, and is very closely related to plants of the order Saxifragaceae; it has a pitcher which closely resembles that of *Nepenthes* in structure and in the function of insect-catching. The flowers are hermaphrodite, apetalous, perigynous, with 6 perianth leaves, stamens in 2 whorls of 6, a gynaeceum, consisting of 6 free apocarpous carpels each with a single basal ovule. The fruit is a one-seeded follicle. The family differs from the Saxifragaceae only in the free, apocarpous carpels and basal ovules. The upper leaves of the plant are flat and green, while the lower leaves are those which bear the pitchers and have lids.

Cepheid Variables, see VARIABLE STARS. **Cepheus**, King of Ethiopia, son of Belus, husband of Cassiopeia and father of Andromeda, was changed into a constellation after his death. (See Ovid, *Met.* iv. 669, and v. 12.)

Cepheus, in astronomy, a constellation of the N. hemisphere, surrounded by Cassiopeia, Ursa Major, Draco, and Cygnus. The prin. star, Alderamin, is one of the third magnitude, while Delta Cephei is an interesting variable which has given its name to many other similar stars—the 'Cepheid variables'—and is also a double star.

Cephisus (**Cephisus**) (Gk *kēphisos*): 1. One of the largest rivs. of Attica, rising in Mt Parnes and flowing S. through the olive grove W. of Athens into the Bay of Phaleron (near Eleusis), E. of Piræus.

2. A riv. flowing through Phocis and Boeotia towards the bed of the anct Lake Copais (Topolias). Now called Mavronero, it empties into the channel of Euboea. Its waters are drawn off in drainage canals.

Cephren, see KHAFFRA.

Cephus, genus of hymenopterous insects of the family Cephidae (stem sawflies), which have no waist and live on plants. The females lay their eggs in stems or twigs and the white larvae eat their way through and thus frequently are very

destructive. *C. integer* is an Amer. species which feeds on willow, and *C. pygmaeus* a European species which lives on corn.

Cepola, typical genus of perch-like fishes of the Cepolidae, or bandfish family. The species are all marine and inhabit European seas; *C. rubescens*, the red bandfish or red snakefish, is a Brit. species which grows to an average length of 12 in.

Ceram, or **Serang**, is. of S. Moluccas, Indonesia; situated between the C. Sea (N.) and the Banda Sea (S.), divided by the isthmus of Taruno into Great and Little C. Very little is known of the interior of the is.; a chain of mts crosses it, the chief height being Binaya (10,000 ft). The land is fertile, and sago is largely grown. The exports are timber, iron, dried fish, edible nests, and birds of paradise. Area about 6600 sq. m.; pop. 100,000.

Ceram Laut, or **Serang Laut**, Islands, Indonesia, group of small is. of the S. Molucca group, situated SE. of Ceram (q.v.).

Cerambycidae, or **Longicorns**, family of coleopterous insects which have elongated bodies, long antennae with their insertion much embraced by the eyes, 5 segmented tarsi and no rostrum. The species live on trees and herbaceous plants, and the larvae are soft, whitish grubs, usually without legs. More than 12,000 species are known, and many of them greatly damage trees, e.g. *Saperda populnea*, which attacks the aspen, and *Elaphidion villosum*, the oak.

Ceramics (Gk *keramos*, earthenware), general term for all the products of the technical process of making objects by baking clay, whether classed as pottery (see DELFTWARE; EARTHENWARE; FAÏENCE; HISPANO-MOORESCUE WARE; MAJOLICA; SLIPWARE; STONEWARE) or as porcelain or chinaware (q.v.).

Ceramium, genus of marine algae belonging to the family Ceramiales. It consists of delicate red, filamentous seaweeds, with the tips of the filaments incurved and a cortical band at the nodes. *C. rubrum* is a common species.

Ceramius, genus of the hymenopterous family Masaridae, is related to the true wasps of the family Vespidae. The forewings of the species are flat, their antennae clubbed, and their homes are usually underground cells.

Cerapus, genus of amphipodous crustaceans, is shrimp-like in general figure, but the first pair of limbs are small, and the second constitute strong pincers; the antennae are strongly developed. *C. tubularis* lives in a small cylindrical tube and exposes only the anterior part of its body. The species occur in abundance in N. America.

Cerargyrite, otherwise called **Chlorargyrite**, or **Horn-silver**, mineral found in S. America and Australia. It is a form of silver chloride, containing 75 per cent silver and 25 per cent chlorine. It is remarkable for malleability and ductility, and is blackened by light.

Cerasin, solid, tasteless, insoluble body obtained from cherry-tree gum. The

soluble part of the arabin (constituting the chief part of gum-arabic) is dissolved out by digesting with water, and C. remains. When C. is heated with nitric acid it yields mucic and oxalic acids.

Cerastes, genus of vipers found in W. Asia and N. Africa. The males, and sometimes the females, have a horn-like process over the eyes, and this feature is responsible for the name of the species *C. cornutus*, the horned viper. The other species, *C. vipera*, has no horns and is said to have been the asp of Cleopatra.

Cerastium, genus of Caryophyllaceae. *C. arvense*, *C. vulgatum*, *C. glomeratum*, are the Mouse-ear Chickweeds native to Britain. *C. biebersteinii*, *C. latifolium*, and *C. tomentosum*, Snow-in-Summer, from S. Europe, are grown in gardens for their silvery foliage.

Cerasus, colony of Sinope on the S. shore of the Black Sea. It gave its name to the cherry, a fruit which grow abundantly in that region.

Cerasus, name which Tournefort gave to a genus now included in *Prunus*, which belongs to the Rosaceae. See PRUNUS.

Ceratina, genus of solitary bees which belongs to the group Scopulipedinae of the family Apidae, or Anthophila. Unlike most bees, the *Ceratina* has very little hair on its body, and like the carpenter-bee of the same group it bores in wood for its home. *C. caerulea* is not uncommon in Britain.

Ceratodus (Gk *keras*, horn; *odous*, tooth), name given to a genus of lung-fishes only one of which is still in existence; many species, however, have been found fossil. The body is long, compressed, covered with large thin scales, and there is a pair of tooth plates in the lower jaws biting against a pair in the roof of the mouth. The swimbladder is lung-like and is used for breathing atmospheric air. They are found in the Trias and less seldom in the Jurassic, and living examples occur in the mud-fish of Queensland rvs. *Epiacratodus forsteri* is commonly called the barramunda (q.v.).

Ceratonia **Siliqua**, sole species of its genus in the Leguminosae, and is known by the name of carob-tree. It is found wild in the countries skirting the Mediterranean, especially in the Levant, and is almost the only tree of Malta. The pods, called algarroba, or St John's bread, contain a sweet nutritious pulp and are used for consumption by human beings and domestic animals. C. S. is said to be the tree which yielded the honey eaten by St John the Baptist, and the seeds are supposed to have been the original of the carat weight.

Ceratophyllaceae, family of a single genus of dicotyledonous, submerged aquatic plants, *Ceratophyllum*, of 4 species. Leaves are whorled, cut, and sessile on round stems; flowers axillary, minute, and monoecious; stamens 12 to 16; carpel single; the fruit an achene.

Ceratophyllum, sole genus of Ceratophyllaceae (q.v.) is represented in Britain by *C. demersum* and *C. submersum*, the hornworts. They are found submerged in ponds and ditches as rootless plants

with much-divided leaves, the old leaves being horny and giving them their popular name.

Cerbera, genus of Apocynaceae, flourishes in S. India, Ceylon, and Madagascar. *C. tanghin*, Ordeal Tree, has a fruit from which the tanghin poison is procured; it was formerly used in trials of persons convicted of crime, their guilt being established if it took effect, their innocence if they survived.

Cerberus, mythical dog who guarded the entrance to Hades. Some ancient writers represent him as having 50 or 100 heads; but later poets allow him only 3 heads and give him a mane and tail of serpents. The twelfth labour of Hercules consisted in dragging C. to the upper world.

Cerberus, genus of Colubridae, belongs to the sub-family Homalopsinae, and consists of viviparous, aquatic snakes common to the rivers and estuaries of the E. Indies from Bengal to N. Australia. *C. rhynchops* has large ventral scales, and none of the species is fatal to man.

Cercamon (fl. 1100), famous Provençal troubadour, b. Gascony. A *tenso* and 3 of his amorous lyrics survive, but the *pastorelas*, of which mention is made by his old biographer, is lost. Marcabrun, a poet of great originality of thought and style and whose historical poems date from 1135 to 1148, was a pupil of C. See F. Diez, *Die Poesie der Troubadours*, 1827; *Leben u. Werke der Troubadours*, 1929 (later eds. by Bartsch, 1883 and 1882 respectively); P. Rajna, 'Cercamon' in *Romania* vi. 115.

Cercaria, scientific name applied to many young Trematodes in the genus *Distomum*, or liver-fluke. They bear considerable resemblance to the adult form, but possess a long, motile tail, frequently have eyes, and the generative organs are only rudimentary. When the eggs of a *Distomum* hatch, the larvae search for a host, e.g. water-snail, and when the C. stage is reached in the host's body they wriggle out of it, swim to another host or foreign body, lose their tails, and encyst. In this form they may be eaten by a vertebrate, e.g. sheep, when they become mature and the larvae once more continue the cycle.

Cercis, genus of leguminous plants, flourishes in Europe, Asia, and America. *C. siliquastrum*, the Judas-tree, so called from the tradition that the false disciple hanged himself upon one, flowers in the open air in Britain. In colour they are a bright pale red, and in the spring they burst out before a leaf appears.

Cercopithecidae, one of the 2 families of Catarrhine Apes, is to be found only in the Old World. The dentition is the same as that of the Simiidae, the inter-nasal septum is narrow, the tail is never prehensile, cheek pouches may or may not be present, and ischial callosities are to be seen. The members of this family include the guernons (*Cercopithecus*), mangabeys (*Cercocebus*), baboons (*Papio*), the macaques (*Macaca*), and the mandrill (*Mandrillus*).

Cercopithecus, or Guernons, genus of Old World monkeys, which have long

tails, ischial callosities, cheek pouches, and are often brightly coloured, e.g. *C. callitrichus*, the green monkey. *C. diana*, the Diana monkey, has a white beard.

Cercyon, son of Poseidon, or Hephaestus, and King of Eleusis. A cruel tyrant, he killed his daughter, Alope, and all strangers whom he overcame in wrestling. He was conquered and slain by Theseus.

Cerdagne (Sp. *Cerdaña*), W. part of the prov. of Roussillon (q.v.) in France during the 14th and 15th cents. The name is now applied to the land on the N. and S. of the Pyrenees, partly in Spain (Catalonia) and partly in France (dept. of the Pyrénées-Orientales). From its broad valley the R. Tév flows to France, and the R. Segre to Spain.

Cerdàña, see CERDAGNE.

Cerdic (fl. c. 495-534), traditionally first king of the W. Saxons. He is said to have landed in England at a place called by the chroniclers *Cerdices ora*, probably in Hants, in 495. He defeated the Britons on many occasions. In 519, with his son Cynric, he founded the kingdom of the W. Saxons. C. was regarded as the founder of the W. Saxon dynasty; but his origins are obscure. Some scholars have suggested that his name is of Celtic origin. In 530 he conquered the Isle of Wight.

Cerdu, Juan Luis de (1560-1643), Sp. author and theologian, b. and educ. at Toledo, where he spent the greater part of his life. He entered the Society of Jesus and was made prof. of theology and belles-lettres. He is principally famous for his able commentaries on Virgil's *Bucolics* and *Georgics* in 1608 and on the *Aeneid* in 1612. He also edited the works of Tertullian in 1624.

Cereals, **Cereal Grasses**, or **Cerealia** form a group of graminaceous plants which are cultivated for their edible seeds; the name is derived from Ceres, the corn-goddess of classical mythology. Botanically speaking the term has no definite limits, for the species of some genera are often cultivated for their grain, while their near allies are of no importance as food. The plants have been grown from the earliest times, and frequently the wild form from which they have sprung is unknown, as in the wheat and barley. The C. which are best known to the human race are wheat or *Triticum*, barley or *Hordeum*, rye or *Secale*, oats or *Avena*, Indian corn (maize) or *Zea*, millet or *Panicum* (also *Sorghum*, *Setaria*, *Pennisetum*), and rice or *Oryza*.

Cereatae, see ARFINO.

Cerebelliaca, see CHAUBEUL.

Cerebral Softening, see BRAIN.

Cerebration, **Unconscious**. It is supposed that all conscious mental processes are accompanied by molecular changes in the cerebrum (see BRAIN, *Functions of the Brain*). Sir W. Hamilton and Dr Carpenter suggested that these changes in the brain may go on without accompanying conscious action. As an example of this, we may take the ordinary experience of suddenly recalling a name or an incident while in the midst of some entirely different line of thought, after having been unable to recall it while

thinking definitely of it. According to Dr Carpenter, the cerebrum, after being put in action by the consciousness, goes on working automatically. This may perhaps be regarded as the physiological interpretation of the psychological statement that some mental processes are unconscious. See Sir W. Hamilton, *Lectures on Metaphysics and Logic* (vol. i), 1859-60, 1874, and W. B. Carpenter, *Principles of Mental Physiology*, 1874.

Cerebro-spinal Fever, see MENINGITIS.

Cerebro-spinal Fluid lies between the coverings of the brain and spinal cord. The outer covering is termed the dura mater, while the inner one, which follows the contours of the brain, is termed the pia mater. Between these two there is a third, the arachnoid, formed of loose connecting tissue. The C. F. is contained partly between the dura mater and the arachnoid, but mainly between the pia mater and the arachnoid. It is formed by the choroid plexuses of the cerebral ventricles (see BRAIN). It passes over all the brain and spinal cord, and acts as mechanism for the exchange of gases and for conveying nourishment to the nervous system. It also acts as a fluid buffer against sudden movements of the brain and spinal cord within their bony casings. It further maintains an equal pressure on the skull, being variable in quantity. It is clear, practically colourless, liquid, being very similar to lymph.

Cerebrum, see BRAIN.

Ceremonies, Master of the, title reminiscent of the 'Governor of the Feast' of the N.T. In the present day it is usually applied to a person who assumes control of affairs at any eccles. or social function.

Cerenkov Counter, device for the detection of very fast charged atomic particles. Cerenkov discovered in 1934 that very fast electrons caused the emission of visible radiation in a transparent medium provided that the velocity of the electrons in a vacuum was greater than the velocity of light in the medium. The flashes of light are of quite different origin from those in scintillation counters (q.v.) and are detected by a photomultiplier (q.v.), and hence counted by a suitable electronic device. See GEIGER-MUELLER COUNTER.

Cereopsis, genus of anseriform birds of the family Anatidae, is one of the least natatorial of its kind. *C. novae hollandiae*, the New Holland or Cape Barron goose, is a handsome bird of grey-brown plumage.

Ceres, Rom. name for Demeter (q.v.).

Ceres, dist. and tn in Cape Prov., S. Africa, near the Hex R. valley and 79 m. from Cape Town by road. It has a good water supply and is a health resort. Pop. of dist.: Whites, 2017; Coloureds, 2790; Bantu, 580.

Ceres, name given to the first discovered of the asteroids (q.v.). It was first seen by Piazzi at Palermo, Sicily, on 1 Jan. 1801, and observed by him till 13 Feb. There was some danger of its being lost again, owing to its proximity to the sun. The difficulty was overcome by the invention of a new method of planetary orbit computation by Gauss. C. is not visible

to the naked eye, being of the seventh or eighth magnitude.

Céret, Fr. tn, cap. of an arron., in the dept of Pyrénées-Orientales, on the Tech. It has talc and cork industries, and manufs. espadrilles. Pop. 5100.

Ceret, see JEREZ DE LA FRONTERA.

Cereus (from Lat. *cera*, wax or torch; the old name for the genus was Torch Thistle), family Cactaceae; a genus of cacti, usually with erect, ribbed, branching stems, with spiny areoles, funnel-shaped, long flowers, large fleshy fruits, and now of a few species, including *C. peruvianus*, the Rock Cactus, *C. jamacaru*, and *C. repandus*, all natives of S. America.

Ceria, genus of dipterous insects, belongs to the Syrphidae, or hover-fly family. The body is elongated and somewhat ovate in form, black and yellow in colour, the general appearance is wasp-like. *C. conoposoides* is a species rarely found in Britain.

Cerignola, It tn, in Apulia (q.v.), 22 m. S.E. of Foggia (q.v.). Near here, in 1503, Gonsalvo di Cordova (q.v.) defeated the French under the Duc de Nemours. The tn has a cathedral, and there are linen manufs., and a trade in agric. produce, olives, and wine. Pop. 51,200.

Cerigo, officially known by its ant. name, *Cythera*, Gk is. lying between the most S. point of the Peloponnese and Crete, but considered as one of the Ionian Is. Area about 100 sq. m. The cap., at the S. end, is called Cythera and its harbour Capsali. Most of the is. is a plateau. Fruit, honey, and cheese are exported and grain is grown. In antiquity the Phoenicians colonised C. where they fished for *murex*, from which purple dye was obtained. They introduced the cult of Aphrodite to whom C. became sacred. Pop. 8000.

Cerinthus (c. AD 100), early Christian heretic. Early accounts seem to agree that the prov. of Asia was the scene of his work, and Hippolytus states that he had his training in Egypt. The teaching of C. was that the world had been made by angels, and the only part of the N.T. he accepted was extracted from St Matthew's gospel.

Cerithium, gastropod mollusc, is to be found in marine, but more often in brackish, water. Like others of the family Cerithiidae, it has a long, many-whorled turreted shell, a short branchial siphon, and a horny operculum. It occurs fossilised in great abundance.

Cerium, one of the 'rare earth' metals, chemical symbol Ce. Atomic weight, 140; sp. gr., 7.0; melting-point, 645°. It resembles iron in appearance. It is malleable and ductile and a poor conductor of electricity. Burns in air, and in the form of wire its flame is brighter than that of magnesium. The metal is prepared by the electrolysis of its fused chlorides, with the addition of a small percentage of sodium or potassium chloride with iron cathode and graphite anode. Sev. mixtures are used for making lighters. C. occurs in a number of rare minerals, one of the commonest being monazite sand; and thorium and

other rare metals contain up to 30 per cent of the oxide; much rarer, but containing some 60 per cent of the oxide, is cerite. See RARE EARTHS.

Cernaui, see CHERNOVTSY.

Cerne Giant, see WHITE HORSES AND HILL FIGURES.

Cernobbio, It. resort, in Lombardy (q.v.), on the SW. shore of Lake Como (q.v.). Near it is the magnificent 18th-cent. Villa d'Este. Pop. (tn) 2600; (com.) 6500.

Cernuschi (Cernuschi), Enrico (1821-96), It. economist, b. Milan; fought as a Republican (1848-9), and in 1850 settled as a banker in Paris. In 1871, having incurred the hostility of the Communards, he left France and travelled in Egypt, China, Japan, England, and America. He was an advocate of bimetalism, and his works, mainly on money questions, include *Mécanique de l'échange*, 1865, *Illusion des sociétés coopératives*, 1866, *Silver Vindicated*, 1876, and *Le Bimétallisme à quinze et demi*, 1881.

Ceroxylon, genus containing 5 Amer. palms, is remarkable chiefly for *C. andicola*, the wax palm of the Andes. The plant grows to a height of about 180 ft among the most rugged precipices of the wild region it inhabits, avoiding tropical plains; its leaves are 18 to 20 ft long, and the trunk is covered with a thick incrustation of wax which is made into excellent candles.

Cerreto Sannita, It. tn, in Campania (q.v.), 16 m. NW. of Benevento (q.v.). It has a fine cathedral. There was some damage during the Second World War. Pop. 6000.

Cerro de Pasco, mining tn and cap. of Pasco dept and prov., 120 m. from Callao, in the highlands of Peru. It has copper and silver mines which are extraordinarily rich, and there are large smelting works; gold, lead, and zinc are also found, and there is an output of 400 tons of coal a day from the Goyllarisquisga canyon, claimed to be the highest coal mine in the world. One of the world's largest vanadium mines is near by at Minasragra.

Cerro Gordo, pass between the mts in E. Mexico on the road from Mexico City to Vera Cruz and about 40 m. from the latter. The Americans under Gen. Scott defeated the Mexicans under Santa Anna here in 1847.

Cerro Largo, dept in NE. of Uruguay, bordered by the Rio Negro on the NW. and Brazil on the E. Large herds of cattle and sheep are pastured on the grass-covered downs. Melo is the cap. Area 5764 sq. m.; pop. 97,260.

Certaldo, It. tn, in Tuscany (q.v.), in the Elsa valley, 16 m. SW. of Florence (q.v.). It is the place where Boccaccio (q.v.) lived and d. His house and other buildings in the tn were damaged during the Second World War. There is a trade in wine, oil, and agric. produce. Pop. (com.) 12,000.

Certhia, genus of passeriform birds, consists of sev. species with moderately long curved bills, short wings, and stiff tail-feathers, which have large feet and strong claws well adapted for climbing

about trees and rocks. The food consists of insects and their larvae. *C. familiaris*, the tree-creeper, is an active little creature common in England, with a monotonous and often repeated note.

Certhiidae, family of passeriform birds known popularly as creepers and found in all parts of the world except S. America, Madagascar, New Zealand, and the Pacific Islands. The species have a long, slightly curved beak and there is a sharp claw on the hind toe; many utter shrill cries, e.g. *Tichodroma muraria*, the wall-creeper, but others are songsters, e.g. *Certhia familiaris*, tree or common creeper.

Certhilauda, genus of the Alaudidae, or lark family, of which the members dwell in arid plains and deserts. The plumage is dull-coloured, and the beak long and curved.

Certificate, in law, may comprise either (1) documents officially prepared by a court for the purpose of notifying another court, or anyone whom it may thereafter concern, of anything directed or ordered in the certifying court; or (2) signed and written statements by various persons admissible as evidence of the facts certified therein. Instances of the first kind are a bankrupt's C. of discharge, a C. of conviction or acquittal on a criminal charge laid before a court of record, a C. of dismissal on a charge before a court of summary jurisdiction, and a judge's C. of costs. Instances of the second class are a public analyst's C., a C. of the registration of a Brit. ship, an alien's C. of naturalisation, an architect's C. as to the due performance of a building contract, a C. of shares in a joint-stock company constituting the document of title to the shares, and a C. of deposit given by a banker for the purpose of certifying that the person named therein has placed a certain sum on deposit account.

Certification, in Scots law, means the express or implied notice to the defender (defendant in Eng. law) that unless he complies with the order in a summons, or shows a reason why he is not bound to do so, certain penalties will be inflicted by the judge. The defender may by custom obtain a special C. against the pursuer (plaintiff) if the latter fails to prosecute an action after having commenced it.

Certiorari, order issuing from one of the superior courts, directing the judges or officers of an inferior court to transmit or cause to be certified (*certiorari facias*) records or other proceedings. The object of the removal is either that the judgment of the inferior tribunal may be reviewed by the superior court, or that the decision and the proceedings leading to it may take place before the higher tribunal. The Crown office rules provide that indictments and proceedings from inferior courts in criminal matters may not be removed by order of C. unless it is clear that a fair trial cannot be had in the inferior court, or that some question of law of unusual difficulty may arise, or that a view of the premises or a special jury in respect of which the indictment is preferred may be required for a satisfactory

trial. The Central Criminal Court (q.v.) has a transferred jurisdiction by order of C. from the various sessional courts within its jurisdiction. An order of C. is demandable as of right by the Crown, but a private prosecutor must apply for leave to obtain such an order.

Certosa di Pavia, celebrated Carthusian monastery in Italy, 5 m. N. of Pavia (q.v.). It was founded in 1396 by Gian Galeazzo Visconti (see VISCONTI), and was dissolved in 1866. The buildings were made a national monument in 1891. The façade of the church, which is very richly decorated, is considered one of the finest pieces of Renaissance work in Italy. The church contains the tombs of Lodovico il Moro (see SFORZA) and his wife, and there are other masterpieces of sculpture, painting, and wood-carving, as well as beautiful stained-glass windows and inlay work. It was near the monastery that Francis I (q.v.) of France was taken prisoner in 1525.

Cerumen, commonly known as ear-wax, is yellow waxy matter, and is secreted by certain glands which lie in the passage leading from the outer ear to the tympanum or drum. Its purpose is to catch particles of dust and other substances, and so prevent them from damaging the drum, and it further serves to lubricate the passage. Sometimes C. is formed in excess, blocking the passage, and it often causes deafness. Oiling and syringing have in these cases to be resorted to so as to remove the wax which has become hard.

Ceruse, see WHITE LEAD.

Cervantes Saavedra, Miguel de (1547-1616). Sp. playwright, poet, and novelist, b. Alcalá de Henares, the son of an apothecary surgeon with 7 children. From 1566 onwards the family lived in Madrid. In 1569 C. contributed some poems to a memoir of Isabel de Valois, the wife of Philip II. In 1569 also we have indisputable evidence that C. was in Rome. In 1570 he became a soldier in the regular service, and in 1571 he took part in the great sea battle of Lepanto, where he lost the use of his left hand. In 1575 he received leave to return to Spain, but his ship was seized by Barbary pirates, and C. and his brother, together with many other Spaniards, were taken to Algiers and there sold as slaves. C. became the slave of a man called Dali Mami and, since he was supposed to be a man of considerable importance, was somewhat closely guarded. Finally, after much difficulty, he was released and returned to Spain in Oct. 1580. During the years immediately following he seems to have visited Algiers and Portugal, and may possibly have been in the Azores. From 1583 to 1587 he produced many plays for the stage, very few of which remain in existence at the present time. In 1585 he produced *La Galatea*, and in the Dec. of the same year he married. He found, however, that he could not earn sufficient with his pen, although he had been exceedingly busy writing numerous dramatic plays, and so in 1587 we find him engaged in gathering stores

for the Invincible Armada. Between this date and the end of the cent. his fortune sank lower and lower. The work which he was doing was ungenial, the pay was often in arrears. He was at least twice imprisoned during this period, and by 1600 his condition was that of extreme poverty. In 1604, however, permission was granted C. to publish *Don Quijote de la Mancha*, the book which had grown out of C.'s lifelong experience of failure and frustration. His work may have been read in MS. previous to this date, but it was first definitely pub. at the beginning of 1605. *Don Quixote* sprang into universal popularity almost at once.



CERVANTES

After an engraving by D. F. Selma.

The breadth of the humanity of the book and its general philosophy did not at first strike the public mind; but its essentially natural character, its broad survey of the types of the time, its masterly dialogue, and its comedy appealed at once, and the book became a huge success. Eds. of it were pirated; it was printed at Madrid, at Lisbon, at Valencia. Within 6 months of its pub., *Don Quixote* and *Sancho Panza* were regarded as proverbial types of character. His main object, as C. himself said, was to ridicule the romances of chivalry; the greater worldwide view of the book came only slowly and was not appreciated, because it was not seen by the greater number of his contemporaries. Even after the pub. of his great book, C. would seem to have remained poor. In 1609 he became a member of one of the Franciscan orders, and in 1613 he pub. and sold his *Novelas Exemplares*, a book which would itself entitle him to rank as one of the greatest of Sp. writers. It consisted of 12 short stories written in his own inimitable style. Between this date and 1614 he pub. some plays and some interludes. The plays are acknowledged by

himself not to be good, but in most cases the prose is good. In 1614 also appeared his most famous poem, the *Viaje del Parnaso*. In 1614 was pub. a second part to *Don Quixote*, this time, however, from the pen of one Avellaneda (see FERNÁNDEZ DE AVELLANEDA), who in his preface taunted C. with his poverty and ill fortune and openly acknowledged that whilst he knew that he (the author) would not stand any chance from a literary point of view in competition with C., he was determined to be the first in the market. The second part from the pen of C. was pub. in 1615, and was received with as much acclamation as had been the first. His last work, *Los Trabajos de Persiles y Sigismunda*, the author did not live to see pub. *Don Quixote* had been trans. into more than 50 different languages, of which the English by Shelton was the first. It was destined to become one of the most popular books of all languages. Its influence on the Eng. novel was enormous. Fielding's *History of the Adventures of Joseph Andrews*, 1742, was written 'in imitation of the manner of Cervantes.' The best complete ed. of C. is by R. Scheyll and A. Bonilla (19 vols), 1914-41. Complete works (trans.) edited by J. Fitzmaurice-Kelly, 1901-6. Trans. of *Don Quixote* by T. Shelton, 1612, 1620; P. A. Motteux, 1712; C. Jervas, 1742; T. Sinollett, 1755; J. Ormsby, 1885. Lives by J. Fitzmaurice-Kelly, 1892 (revised ed., 1913), and A. F. Calvert, 1905. See also Américo Castro, *El pensamiento de Cervantes*, 1925; S. de Madariaga, *Don Quixote*, 1935; W. J. Entwistle, *Cervantes*, 1940; L. B. Walton, *Cervantes*, 1948; and introduction to *Don Quixote* in Everyman's Library.

Cervera y Topete, Pascual (1839-1909), Sp. admiral and commander-in-chief during the Sp.-Amer. war of 1898. He was b. at Jerez in the prov. of Cadiz. When the war broke out, he sailed for Cuba with secret orders to defend Sp. interests. He reached Santiago on 19 May, and was there blockaded by Adm. Sampson, commanding the Amer. fleet. The latter tried to block the harbour by sinking the *Merrimac*, but failed to do so, and on 3 July the Sp. fleet endeavoured to escape. This was done in response to public opinion, but against C.'s judgment. The result was that the Americans captured or sank every Sp. ship, killed a third of their crews, and C. was made a prisoner. When the war ended he returned to Spain, where he was tried by court-martial, but honourably acquitted.

Cerveteri (formerly *Cervetri*), It. vil., in Lazio (q.v.), 20 m. WNW. of Rome (q.v.). It is built at the site of the Etruscan (see ETRURIA) city of *Caere*; the old city remained prosperous down to the 13th cent. There is a famous Etruscan necropolis here, some of the tombs in which are cut out of the solid rock. Pop. 2000.

Cervetri, see CERVETERI.

Cérvia, It. tn, in Emilia-Romagna (q.v.) on the Adriatic, 14 m. SE. of Ravenna (q.v.). With Ravenna it gives its name to an archbishopric. It is a

modern bathing resort with a fine beach. Its N. part is called 'Milano Marittima.' Pop. 12,000.

Cervidae, deer family, of the artiodactyl div. *Pecora*. Extinct genera are found fossil. The members of the family are distinguished by their antlers, features possessed by no other ruminants, which are present in all male deer but *Moschus* and *Hydropotes*, and in the females also of *Rangifer*, the reindeer. In the genus *Elaphodus* the antlers are devoid of any branching, but in *Cervus* there are sev. branches and there may be as many as 48 points. A gall-bladder is present only in *Moschus*, the Asian musk-deer, and in the family Bovidae (q.v.) only one genus lacks this organ; all deer have two orifices to the lachrymal duct, and only one genus of antelope has this feature; and in sev. minor points the C. may be shown to differ from the Bovidae. The 60 or so species of deer are spread over Europe, Asia, America, and part of Africa, and are totally lacking in Australia.

Cervin, Mont, see MATTEIHOEN.

Cervole, Arnaud de, see ARNAUD DE CERVOLE.

Cervus, see DEER.

Cesalpino, see CAESALPINUS, ANDREAS.

Cesarevich, title of the heir to the throne in Imperial Russia.

Cesari, Giuseppe (1568-1640), called Il Cavaliere d'Arpino, b. Rome, where he became a successful and wealthy painter. He was the rival of the Carracci and Caravaggio (q.v.) to whose 'naturalism' his own conventionally idealistic style was opposed. He painted a series of frescoes depicting Rom. hist. for the Capitol.

Cesarini, Giuliano (1389-1444), also known as Cardinal Giuliano. It. diplomatist. He studied law at Padua, and won the favour and patronage of Pope Martin V, who created him a cardinal in 1426. In 1430 he was sent to Germany as papal legate to preach a crusade against John Huss and his followers. He was present at the Battle of Tans in 1431. He became president of the Council of Basel in 1431, but as his propositions were not agreeable to the council he resigned in 1438. He was also a leading member of the Council of Ferrara. The King of Poland, Ladislaus III, had conquered the Turks and made a treaty with them, when C. approached him as papal legate and persuaded him to go back on his word. The result was disaster. In 1444 they fought the Turks at Varna, and both C. and the king were killed. See COUNCILS, THURCH.

Cesarotti, Melchiorre (1730-1808), It. writer, b. Padua, of noble but poor family. He became a prof. of Greek and Hebrew at the univ. in his native tn in 1768, and held that position all his life. When Italy was invaded by the French, he wrote in defence of their cause, and Napoleon I made him a knight of the Iron Crown, and gave him a pension. By way of expressing his gratitude he wrote an epic poem in praise of Napoleon called *Pronca*. His most important original work was *Saggio sulla Filosofia delle*

Lingue, 1785, advocating a free development of language as opposed to the teaching of the Della Cruscan Academy at Florence. He also wrote a book called *Filosofia del Gusto*. His great work of trans. was Macpherson's *Ossian*, first pub. in 1763. This exercised a great influence in Italy and elsewhere. His introductory preface was trans. into English and edited with notes by J. McArthur in 1806. He also attempted a prose trans. of the *Iliad*, which he followed with a long verse paraphrase running into 10 vols., entitled *La Morte d'Ettore*. In 1772 he trans. some of Voltaire's plays and Gray's *Elegy*.

Cesena (anct *Caesena*), It. tn, in Emilia-Romagna (q.v.), on the Savio, 12 m. S.E. of Forlì (q.v.). Murat (q.v.) defeated the Austrians here in 1815. The tn, to the hist. of which Dante alludes in his *Inferno*, lies in a valley, overlooked by a fortress. It has a cathedral (partly 14th cent.) and a famous library, the *Biblioteca Malatestiana* (see MALATESTA), containing valuable MSS. and incunabula. There is a race-track, and the dist. produces hemp, silk, wine, and sulphur. Two popes, Pius VI and Pius VII (qq.v.), were b. here. Pop. (tn) 23,500; (com.) 67,700.

Cesenatico, It. tn, in Emilia-Romagna (q.v.), on the Adriatic, 18 m. E. of Forlì (q.v.). It was bombarded by Brit. ships in 1800. It is a fishing port and a popular bathing resort. Pop. 13,500.

Cesis, see WENDEN.

Česká Lípa (Ger. *Böhmisch-Leipa*), Czechoslovak tn in, the region of Liberec (q.v.), with chemical and foodstuff manufs. Pop. 12,000.

Česká Třebová (Ger. *Böhmisch-Trübau*), Czechoslovak tn, in the region of Pardubice (q.v.). It has engineering and textile industries. Pop. 11,700.

České Budějovice: 1. Region (*kraj*) in SW. Czechoslovakia, bordering on Austria and Bavaria, part of the former prov. of Bohemia (q.v.). It is watered by the Vltava (q.v.). Area 3460 sq. m.; pop. 494,000.

2. (Ger. *Budweis*) Czechoslovak tn, cap. of the region of C. B., on the Vltava. It was founded in 1265, is the seat of a bishop, and has a fine cathedral (partly 13th cent.) and other noteworthy buildings. It is an important commercial and industrial tn, is in an anthracite-producing area, and manufs. chemical, metal goods, machinery, and pencils. Pop. 38,200.

Československá Republika, see CZECHOSLOVAKIA.

Český Brod (Ger. *Böhmisch-Brod*), Czechoslovak tn, in the region of Prague (q.v.). The Hussites (q.v.) suffered a defeat near here in 1434. Pop. 5800.

Český Krumlov (Ger. *Krumau*), Czechoslovak tn in the region of České Budějovice (q.v.), on an is. in the Vltava. It has an anct castle and important sawmills. Pop. 11,800.

Český Les, see BOHEMIA, FOREST OF.

Český Tešín, see TEŠÍN.

Cesnola, Luigi Palma di, Count (1832-1904), explorer, b. Rivarolo, near Turin. He fought in the war with Austria, 1848, and in the Crimean War, and in the Civil War

in America he had a command with the N. army. In 1865 he was made Amer. consul at Cyprus, and while in that position he began his excavations at Dail, Curium, and Larnaca. The Museum of Art in New York bought nearly all his collection, and he was appointed its director in 1878. He brought out a book entitled *Cyprus: its Ancient Cities, Tombs, and Temples*, 1877.

Cessio Bonorum, in Scots law, a system which enabled any person who was in prison for civil debt, or against whom such a writ of imprisonment had been issued, to present a petition setting forth his inability to meet his liabilities and his willingness to convey the whole of his property to a trustee for the benefit of his creditors. C. B., like the old insolvency system in England, was characterised by this important difference from mercantile bankruptcy, that the person who obtained the privilege was not discharged from his debts, but only from proceedings against his person. After the Debtors Act, 1880, which virtually abolished imprisonment for debt, the term C. B. was applied to sequestration (in Eng. law, 'adjudication') in minor bankruptcies. C. B. was abolished by the Bankruptcy (Scotland) Act, 1913.

Cession (Lat. *cedere*, to yield), name given in international law to the formal transfer of ter. from one state to another. This may be the result of a gift, an exchange, or a sale, but is more usually due to the fortune of war, most C.s having been exacted as the price of peace between warring nations. The consent of the people of the ceded ter. is not essential, but deference is often paid to their wishes, except by modern totalitarian states. Their civil and political rights should be and generally have been determined by the treaty under which the C. is made. Apart from special stipulations, the citizens transfer their allegiance from one sovereignty to the other, obtaining their share in the rights of the new state, though, in recent instances of 'cession,' as, e.g., in the case of Czechoslovakia and Poland, the Ger. and Russian Govs. first set up puppet govts. and then accorded the inhab. only such rights as were convenient to Ger. and Russian interests respectively. But according to international jurists, the position is that old laws continue valid until altered by the new sovereign. Titles to property and personal relations remain unchanged. If the citizens should suffer loss of property by the C., the ceding state is not bound to indemnify them. Usually a clause in the C. treaty deals with the question of debts. As the object of C. is sovereignty over the ceded ter., all such individuals domiciled therein as are subjects of the ceding state become *ipso facto* by the C. subjects of the acquiring state. The hardship involved in the fact that in all cases of C. the inhab. of the ter. who remain lose their old citizenship and are handed over to a new sovereign, whether they like it or not, revived after the First World War a movement in favour of the claim that no

C. should be valid until the inhab. had by plebiscite given their consent to the C. Moreover sev. treaties of C. concluded during the 19th cent. stipulated that the C. should only be valid provided the inhab. consented to it through a plebiscite. But it seemed doubtful whether the law of nations would ever make it a condition of every C. that it must be ratified in such a way. By the treaties of peace after the First World War the method of a plebiscite was adopted in a number of cases. In any case the hardship of the inhab. being handed over to a new sovereign against their will can be lessened by a stipulation in the treaty of C. binding the acquiring state to give the inhab. of the ceded ter. the option of retaining their old citizenship on making an express declaration. But it must be emphasised that, failing a stipulation expressly forbidding it, the acquiring state may expel those inhab. who have made use of the option and retained their old citizenship, since otherwise the whole pop. of the ceded ter. might actually consist of aliens and endanger the safety of the acquiring state. In many cases an option of neutrality was accorded in the treaties of peace following the First World War to the inhab. of ters. ceded under them. The terms of the option varied in each particular case; but the general principle applied was that persons habitually resident in ceded ter. acquired *ipso facto* the nationality of the state to which the ter. had been transferred, and lost the nationality of the ceding state. Nevertheless such persons, if over 18 years of age, might opt for their old nationality, and if they exercised that option their choice covered a wife and any children under 18 years of age. They must, however, in that case remove themselves to the ter. of their old state (L. F. L. Oppenheim, *International Law*). See T. J. Lawrence, *Principles of International Law*, 1910; W. E. Hall (ed. Higgins), *Treatise on International Law*, 1917; J. L. Brierly, *The Law of Nations*, 1928.

Cessnock, coal-mining tn. of New S. Wales, Australia, 130 m. N. of Sydney by rail. Pop. 14,630.

Cesti, Pietro Antonio (1623-69), It. composer, b. Arezzo, where he was a boy chorister at the cathedral. In 1637 he became a Minorite friar. He studied under Carissimi in Rome, lived at Volterra in 1645-8, and later seems to have served alternately the papal chapel in Rome and that of the Archduke Ferdinand at Innsbruck. His last years, 1665-9, were spent in Vienna, where he produced 5 operas, but he d. at Florence. His work includes church music and sacred cantatas, but it was as an opera composer that he became most famous, his 15 operas being produced at Venice, Lucca, Innsbruck, Florence, and Vienna, and of course, given elsewhere. *Il pomo d'oro* (Vienna, 1667) is the most elaborately spectacular baroque opera known to musical hist.

Cestoda, or **Cestoid Worms**, form an order of Platyhelminthes, or flat worms, and from their elongated shape are known

as tapeworms. They are all parasitic and only one genus reaches the adult stage outside the alimentary canal of vertebrates. The tapeworm consists of a head, or *scolex*, which attaches itself to the lining of the canal by suckers or hooks, and most of the species then show a long chain of segments, or *proglottides*, each of which, when separated from the others, lives as an independent animal. A few species, however, have no external segmentation, and do not break off in this way. In no species are there sense organs, vascular system, mouth, or alimentary canal, food being absorbed by the body from the host, but there are a nervous and a well-developed excretory system. The life hist. is curious. The detached proglottides pass out of the host, and the eggs are scattered. These are swallowed by a new host in its food or drinking-water and the embryos eventually bore into the blood-vessels and are carried to the various organs. Thereupon they change into a *cystic* or *bladder-worm*, and develop a *scolex*, and if the animal in which they live is eaten by another the *scolex* passes into this final host, enters the alimentary canal, and matures. Among the vertebrates attacked by the C. are man, dog, sheep, ox, horse, hare, rabbit, squirrel, fox, pig, rat, mouse, frog, and sev. birds. *Diphyllobothrium latum* (*L. schriefferi*), the largest species preying on man, may attain a length of 30 ft; *Coenurus cerebralis* destroys many sheep, causing the disease of staggers; and various members of the genus *Taenia* may infest human beings. *T. saginata* is the beef tapeworm, still common in many countries; *T. solium*, the pork tapeworm, is not so common. The bladder-worm stage of *T. echinococcus* sets up hydatid cysts in various internal organs; this species becomes adult in dogs and consequently it occurs chiefly in people, e.g. Eskimos, closely associated with these animals. Cooking destroys the cysts present in infested meat and pork, and proper cooking therefore is the chief means of preventing the parasite from being passed on to human beings. Cooks and those who handle raw meat frequently—as in sausage-making—must take particular care to avoid transferring particles of raw meat to their mouths.

Cestus: 1. Thong of leather which the Gk and Rom. boxers wore on their hands. They were not used, as are modern boxing-gloves, to soften the blow, but to make it harder, as these thongs were often weighted with iron or lead. See **BOXING**.

2. Magic belt of Aphrodite (Venus) which made any who saw her fall in love with her.

Cestus Veneris, or **Venus's Girdle**, species of *Ctenophora* found in the Mediterranean and Atlantic. The body of this coelenterate is much compressed, and becomes ribbon-like in shape; it often exceeds 1 yd in length. *C. pectenalis* resembles it in appearance, but has a patch of orange at each end of its body.

Cetacea, large order of mammals, consisting of whales, dolphins, and porpoises,

but the form and purely aquatic habit of its members led them to be classed erroneously with fishes. They have a tapering tail expanded into horizontal flukes which aid the creatures in their powerful locomotion; there are no posterior limbs, and the anterior limbs are converted into paddles which are unprovided with external digits. They are unlike fish in nearly all important characteristics, such as that they possess warm blood and breathe air; in connection with this feature it may here be mentioned that in spouting whales do not blow sea-water,

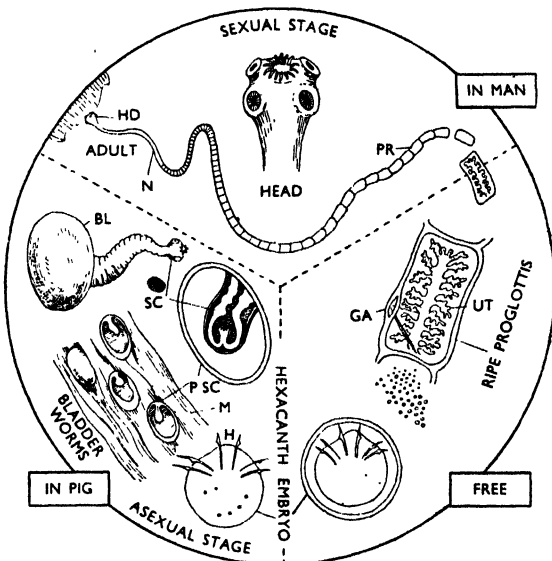
found in rivs. of Asia and S. America. On land they are helpless, and after being for a short time out of their native element they die, probably crushed by their own weight. In diet all cetaceans are carnivorous, their chief food being cuttlefish, squid, crustaceans, and true fishes; some even devour seals and smaller whales; the whalebone whales feed on the minute animals of the surface waters (plankton). In disposition they seem gentle and docile. The minimum size of one of these animals is about 3 ft. and the maximum is the enormous length of

CESTODA (TAPEWORMS)

In man. HD, head; N, neck; PR, proglottides.

Free-living. Free proglottis and egg-cases; UT, uterus; GA, genital aperture. Embryo within the egg case.

In pig. H, hexacanth embryo; P, SC, proscœlex; M, muscle of pig; SC, scolex; BL, bladder.



and any water that can be seen is the condensed vapour of their breath. Among the C. a hairy covering is always absent, but it is represented usually by a very few bristly hairs about the mouth easily counted; the warmth of which they would be deprived by the absence of the covering is amply replaced by a thick layer of blubber under the skin. The head of the animals is always very large, the nostrils are seen as a single or double blowhole placed generally far back on the skull, the bones are spongy and full of oil, teeth are present or absent, there is no collar-bone, the eyes are tiny when compared with the bulk of their owner, and there is no external ear. The females usually bring forth 1 at a birth; their 2 mammae are inguinal in position and are adapted to the function of feeding the young in the water; the mother proves most devoted to her offspring. Whales are very widely distributed throughout the seas of the world, and a few are to be

100 ft. Fossil C. have been found in the Eocene, Miocene, and Pliocene (sub-order Archaeoceti). The 2 suborders of living C. are the Mystacoceti or whalebone whales and the Odontoceti or toothed whales. In the former div. are to be found the species known as right whales, rorquals, the grey whale, the blue whale, and the hump-back whale; in the latter occur the sperm whales, bottlenose, dolphins, porpoises, the narwhal, white whale or beluga, the killer, and the pilot whale. See separate articles for products and species. See also WHALE.

Cetatea Alba, see BELGOROD-DNESTROVSKIV.

Cethagus, name of a Rom. patrician family of the gens Cornelia:

Marcus Cornelius Cethagus (d. 196 BC) was censor in 209 and consul in 204 BC. He was renowned as an orator, and Horace refers to him as an authority on the use of Lat. words.

Gaius Cornelius Cethagus was one of

Catiline's fellow conspirators in 63 BC. He stayed in Rome intending to murder a number of leading senators, but Cicero (q.v.) arrested him and had him put to death.

Cetin ($C_{22}H_{44}O_2$), fatty crystalline substance, insoluble in water, but soluble in alcohol and ether. It melts at 49° C. and volatilises at 360° C. It is the chief constituent of spermaceti, a wax found in the body of the sperm whale and other cetacea. C. is employed as an emollient, and for the manuf. of candles, etc.

Cetinje (Cetynye), tn in Montenegro, Yugoslavia, built on a plateau surrounded by mountains. It was founded in 1485 as a refuge from the Turks, and was for more than 400 years the cap. of the principality of Montenegro (q.v.). The first book in a Slavonic language is said to have been written in the monastery here. The 2 palaces (one anct, one 20th-cent.) of the former rulers, remain, and there is a 15th-cent. church. Pop. 11,100.

Cetonia, genus of coleopterous insects of the family Scarabaeidae, inhabits warm lands. *C. aurata*, the rose-chaffer, is a beautiful bright green beetle. Both larva and imago feed on vegetable substances, but *C. floricola* is said to live in ants' nests in the larval state and to eat the young.

Cetraria Islandica, or Iceland Moss, fruticose or shrub-like lichen procured mostly from Norway and Iceland, but also a native of the higher mts of N. Britain. When dry it is almost odourless and the taste is bitter and unpleasant, but when the bitter principle is removed it becomes a wholesome and palatable food. It must first be boiled in water, upon which it becomes a mucilaginous fluid; unless steeped it is offensively bitter, and its purgative properties have given it the name of *Lichen catharticus*.

Cette, see SÈTE.

Cetus, The Sea Monster, constellation situated S. of Pisces and Aries. It was supposed to represent the sea monster about to devour Andromeda. Although it covers a large expanse of sky, no star in it is of a brighter magnitude than the third. Omicron Ceti—generally known as Mira Ceti—is a long-period variable. In about 332 days it increases in brightness from below the ninth magnitude (when it is visible with a 3-in. telescope) to about the second magnitude, and then declines. Its period varies from 320 to 370 days, and its maximum and minimum luminosity is not invariable. It is historically interesting as being the first recorded variable, its fluctuations being noticed in the first instance by David Fabricius in 1596. No satisfactory explanation has yet been given of its remarkable variations.

Cetyl Alcohol, see ETHAL.

Cetywayo, phonetically spelt Ketshwyo (c. 1836-84), son of the Zulu King Panda, whom he deposed in 1856. He defeated his brother Umbulazie, and then his right to the throne was acknowledged by Natal on the conditions that he dispersed his troops and gave up his barbarous mode of governing. It was owing to

the Transvaal being annexed in 1877 that Britain had to enforce these measures, and in 1879 C. was made a prisoner by Maj. Marter and lodged in Cape Town. He was brought to England in 1882, but through pressure of public opinion he was restored as the king of the Zulus in 1883. However, very soon after he returned to his native land he was attacked by one of his old enemies named Usibepu, and had to seek an asylum in the native reserve on Brit. ter. C. d. at Eshowe.

Ceulen, L. van, see KEULEN.

Ceuta, fort and seaport which, until Morocco became a sovereign state, belonged to Spain, situated on the E. of the Moroccan peninsula which juts out N. towards Gibraltar. It is supposed to be the anct tn Abyla, one of the mythical Pillars of Hercules. It consists of an old tn right on the tongue of the peninsula, and a new tn running up the hills at the back. It is a bishop's see, and has a fine 15th-cent. cathedral. C. was once a very busy tn and did a great trade under both Rom. and Arab rule. It was conquered by King John I of Portugal in 1415, but passed into the hands of Spain in 1580. Pop. (1945) 60,353.

Ceutorhynchus, genus of coleopterous insects of the family Curculionidae, is a small weevil with many species, which hewts various plants.

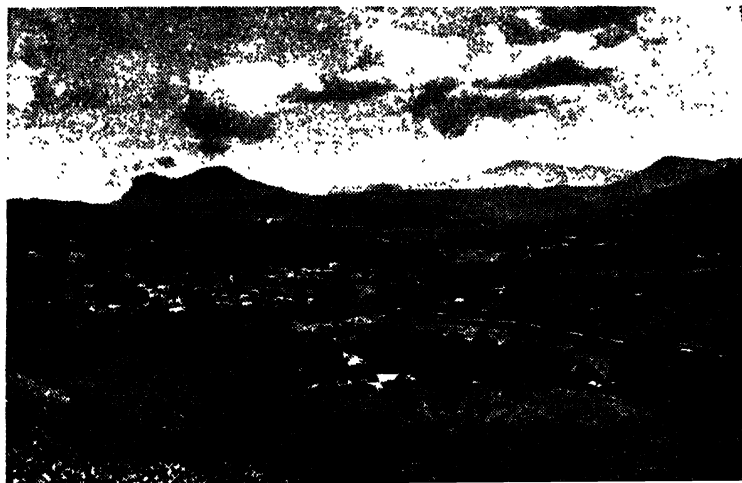
Cevadine, alkaloidal substance found in hellebore and sabadilla. It occurs in white crystals, soluble in water, alcohol, and ether. In medicine it has been used to expel worms, but it is very poisonous.

Cévennes (from Celtic root, cf. Welsh *cefn*, ridge), important mt range in SE. France, extending (in its widest application) from Canal du Midi (N. of Carcassonne) to the S. of the Côte d'Or. This range is some 330 m. long, forms the SE. border of the central plateau, and the watershed between the Rhône and Garonne. Sometimes the name is confined to the S. ranges only, ending at the gorge of the Chassezac, N. of Montagne de Lozère. In its narrowest signification it means only those mts E. of the plateaux of the Causses, beginning with Lozère plateau and ending with those round Aigoual at the head of the Gard valley. The large group is divided into 2 divs.: N., with Monts du Charolais, Beaujolais, Lyonnais, Vivarais (Mt. Mézène), and S. with Montagnes Noires, C. proper, Garrigues, Monts de l'Épinouse and Lozère (Lozère, Pic de Finiels, Mt. Aigoual). The Loire, Allier, Tarn, Aveyron, Gard, and other rivs., rise in the C. In the NE. a railway from Nîmes crosses the range by Alais to the valley of Allier and Clermont. The central mass lies in the depts of Ardèche, Lozère, Haute-Loire. The rocks are chiefly metamorphic and granitic, volcanic in parts. The revolt of the Camisards (q.v.) occurred here. See R. L. Stevenson, *Travels with a Donkey in the Cévennes*, 1879; Porcher, *Le Pays de Camisards*, 1894; Ribard, *L'Histoire cévenole d'après des documents*, 1898; A. Chanson, *A Mountain Boyhood*, 1947; J. Salels, *A House in the Cévennes*, 1949.

Ceylon (Sanskrit Sinhala), is. in the Indian Ocean, crown colony of Great Britain until 1948, when it became a self-governing dominion. It is separated from India by the Gulf of Manaar and Palk Strait, but virtually joined to the mainland by the submerged coral reefs and sandbanks known as Adam's Bridge, and by Itanmeswaram Is. It lies between 5° 55' and 9° 50' N. lat., and 79° 40' and 80° 53' E. long. Length from Dondra Head to Palmyra Point about 266 m., width varies from 32 to 140 m. Area over 25,000 sq. m. The is. is mountainous in the S., expanding into a wide plain

The soil is mostly fertile, and vegetation very luxuriant. The time of greatest heat is between the 2 monsoons, from Feb. to May. The 3 main agric. crops, upon which the economy of the is. largely depends, are tea, rubber, and coco-nuts. For home consumption rice (paddy) is widely grown, and special efforts are being made to increase production. Tea, of which the is. is one of the largest producers in the world, accounted in 1954 for 65 per cent of the export income.

Of its mineral resources, plumbago (graphite) is of most commercial value; precious stones, notably rubies and



E.N.A.

TEA PLANTATION DISTRICT IN CEYLON: ON THE LEFT, ADAM'S PEAK

towards the N., still partly impenetrable jungle. The loftiest peak is Piduru Talagala, over 8000 ft; the best known is Adam's Peak, over 7000 ft. There are 9 provs. for administrative purposes pre-arranged by gov. agents. The longest riv. is Mahaveli (Ganga), 206 m., flowing into the sea by Trincomalee Bay. The SW. is well watered, but NE. and SE. require irrigation, and remains of vast reservoir basins for this purpose are found in the N.

The climate is tropical, but the heat is tempered by the surrounding sea. Nuwara Eliya, the chief hill station, 6200 ft, has a mean temp. of 58°. Colombo one of 80°. Among C.'s chief tns are Colombo (its cap. and chief seaport), Jaffna, Kandy, Kalutara, Peradeniya, and Point de Galle. In the N. are the famous ruins of Anuradhapura. There are sev. short railway lines, the longest being between Colombo and Kandy. The total railway mileage is 898 (811 being 5 ft 6 in. gauge, the rest 2 ft 6 in.).

sapphires, are found in considerable quantities. Recently various earth minerals and china clay have been identified. Most tropical wild animals are to be found, and special measures have been taken to protect elephants. There are countless kinds of ferns and flowers, innumerable species of birds, and many reptiles, including crocodiles. C.'s chief imports are rice, textiles, wheat flour, and fuel. The leading exports in order of total value are tea, rubber, and coco-nut products. The value of the exports to the U.K. (1956) was 498.3 million rupees, and of imports from the U.K. 344.6 million.

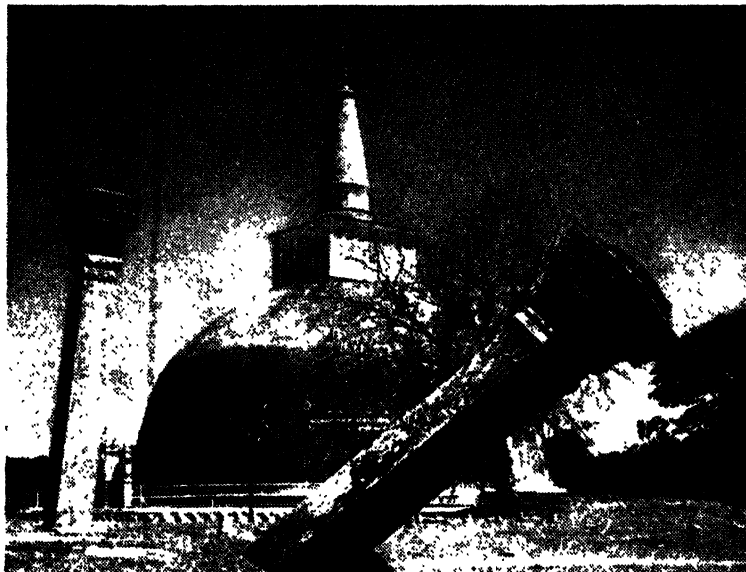
History. The Portuguese reached C. in 1505, and estab. commercial settlements. They were driven away by the Dutch, 1656. In 1785 C. passed into Brit. possession, being first annexed to Madras; 6 years later the is. was ceded to Britain under the treaty of Amiens (25 Mar. 1802), and C. was then formed into a separate crown colony, the Kandyan kings finally disappearing voluntarily, 1815. The is.

of C. was known to the Greeks and Romans under the name of Taprobane (copper lead) and in later times Serendib, Sririndul, and Zeylan were used to designate it by writers of the V. and E. worlds. Sinhalese kings ruled from 543 BC to AD 1815.

Historical records are scanty, but it is known that there were constant irruptions from S. India. It is also known that at the friendly intervention of the Emperor Asoka of India, Buddhism was introduced in the 3rd cent BC and has

municipal or urb. councils exceed 50,000. Great attention is being paid to the extension of educational facilities, Sinhalese, Tamil, and English all being used as the medium of instruction. There are (1954) 3581 gov. schools with 845,000 pupils and 2181 assisted schools with 687,000 pupils. Teachers in training have been more than doubled in 7 years. The univ. of Ceylon (1948) caters for 2400 students, and 277 adult classes and centres have been estab.

Constitutional developments. The germs of a representative system of gov. in C.



Department of Information, Colombo

RUVANVELISEAYA, ANURADHAPURA
The most venerated dagabo in Ceylon.

remained the prevailing faith in C. ever since. Anuradhapura was sacked about AD 1000 by Tamils from S. India, but between AD 1050 and AD 1150 the Sinhalese kings re-estab. their authority with their centre at Polonnaruwa.

Population, etc. The pop. in 1953 was 8,000,000; of these some 5,500,000 are Sinhalese and 900,000 are Ceylon Tamils. There are 460,000 Moors, i.e. Muslims. There are nearly 1,000,000 Indians, not regarded as Ceylonese, most of them Tamil labourers from S. India, working on tea and other estates. Sinhalese, a language derived from Sanskrit and with close affiliations to 'Pali,' is the official language. Tamil, a Dravidian language, is spoken in the N. Colombo is increasingly the greatest urb. centre, with a pop. of 420,000. Only 5 other

have existed since 1829, but for many years officials in the Legislative Council outnumbered the non-officials. By a reform of 1910 the official majority was reduced to one, but the majority of the non-officials were not elected but nominated. Between 1920 and 1924 further changes were introduced, providing a non-official majority in the Legislative Council and non-official representation on the Executive Council. This system, however, which still reserved all real power to the Executive Council and in the last resort to the governor, served in the main to encourage complete irresponsibility in the Legislative Council, which was in fact constitutionally irresponsible. In 1927, therefore, the Donoughmore Commission was appointed to recommend constitutional revision,

and their report was submitted in June 1928, about 7 months after they had first arrived in C. They focused their attention upon the divorce of power from responsibility. The Legislative Council, having power over finance but no power to initiate expenditure, had become a permanent opposition devoted to obstruction. The theory of the old constitution that the gov. should be a partnership had broken down, or, at all events, had become a mockery of the party system, because the gov. could not claim to represent any one racial group in the council, whereas the unofficial block, externally united only in attacking the gov., were divided upon every other positive matter. The Donoughmore Commission made political re-education the main requirement of the situation, and proposed universal suffrage. They proposed the estab. for the gov. of C. of a system which had hitherto worked satisfactorily in the sphere of local gov. They recommended the estab. of a State Council which would give both responsibility and power to its members. It was to possess legislative powers as a general body. It was also to exercise its powers. The depts of gov. were to be divided into 10 groups. Three of them were to be in charge of officers of state (the chief secretary, the financial secretary, and the attorney-general—legal secretary), who were to be members of the State Council but without the right to vote. The remaining 7 groups were to be controlled by the elected members of the State Council, who were to be divided into 7 executive committees of home affairs; agriculture and lands; local administration; health; labour, industry, and commerce; education; and communications and works. These committees were to elect their chairmen, and these chairmen, together with the officers of state, were to form the board of ministers. The State Council was to consist of 65 territorially elected members, in addition to the 12 nominated members. Officials, of course, had no place in such a council, where there was no question of commanding a majority. The Legislative Council, whose representation was based on communal lines, naturally opposed the abolition of communal representation. The Sinhalese supported the commissioners as its abolition coincided with their interests. The Tamils objected to the estab. of electorates based on numbers which would prejudice their influence; the Muslims and burghers, however, supported communal representation as it was their one safeguard against political extinction. The other features in the Donoughmore report which were strongly opposed were the system of executive committees and the wide powers given to the governor. The executive committee system was condemned 'either as unworkable or as derogatory to the status and proper functions of a minister... or as an impediment to further constitutional evolution towards the desired goal.' The secretary of state agreed to the proposal of the Legislative Council to have a State Council of 50 territorially

elected members and 8 nominated members, of whom 4 were to be Europeans. The proposals of the secretary of state were finally accepted in the council by the unofficial members by 19 votes to 17. The Donoughmore constitution was estab. by Sir Graeme Thomson in 1931, but requests for changes were made from 1932. The secretary of state refused to consider any radical alteration of the constitution before it was given a fair trial. In 1937 Sir Andrew Caldecott was asked by the secretary of state to examine the position and submit recommendations. He proposed the estab. of a cabinet system of gov. by the exclusion of the



E.N.A.

THE OLD DUTCH GATE AT GALLE

officers of state and the appointment of 2 other ministers to be entrusted with their work. These proposals led to no general agreement and the Colonial Office felt that the whole position should, in view of the approach of war, be postponed for fuller consideration.

After the war a new commission under the chairmanship of Lord Soulbury visited C., and recommended a form of constitution akin to the Brit. constitution. They thought that the existing system of universal suffrage should be retained and recommended the setting up of a Senate of 30 members and a House of Representatives of 95 elected members plus 6 members nominated by the governor-general. Instead of the 'board of ministers' there would be a Cabinet responsible to the legislature. The governor-general would be empowered to legislate on external affairs and defence. Currency Bills and any Bill likely to involve 'oppression or serious injustice' would be

treated as 'reserved' Bills. The Brit. Gov. (Oct. 1945) accepted the Soulbury committee's report, having come to the conclusion that a constitution on the general lines proposed by the commission conformed in broad outline, save as regards the second chamber, with the constitutional scheme put forward by the C. ministers themselves (see Cmd. 6690, 1945: Statement of Policy on Constitutional Reform). The recommendations were not greatly to the liking of minority communities in C., while the Sinhalese

Minister of C. and representing the king. The Gov. of the U.K. is now represented by a high commissioner as in the case of the other dominions. Agreements, concluded in Nov. 1947 between the U.K. Gov. and the Gov. of C. as a prelude to this constitutional development, make provision for defence and external affairs, and the protection and/or compensation of officials appointed by the secretary of state.

The C. Gov. have announced their intention to become a rep. within the Commonwealth, as is the case with India and Pakistan, but have fixed no date for putting this into effect.

Bibliography. **DESCRIPTIVE:** Leclerc, *L'Île de Ceylon*, 1900; Ferguson, *Ceylon in 1903*, 1904; C. B. Elliot and A. L. Martin, *The Real Ceylon* (Colombo), 1924; L. Woolf, *The Village in the Jungle*, 1925; R. H. Bassett, *Romantic Ceylon: its History, Legend, and Story*, 1929; J. Still, *The Jungle Tide* (forest and jungle life), 1930; R. L. Spittel, *Far Off Things*, 1933. **HISTORICAL:** J. E. Tennent, *Ceylon*, 1860; J. Ribeiro (trans. by P. E. Pieris), *History of Ceilão*, 1909 (the early hist. of C.: Ribeiro dictated his hist. to the King of Portugal in 1685 and this is the first Eng. trans. from the original Portuguese); R. Knox, *An Historical Relation of Ceylon together with somewhat concerning several Remarkable passages of my life that hath happened since my deliverance out of my captivity* (reprint of the ed. of 1681), 1911; H. W. Codrington, *A Short History of Ceylon*, 1926; L. A. Mills, *Ceylon under British Rule, 1795-1932*, 1933 (the only comprehensive account of the Brit. regime since the pub. of Sir J. E. Tennent's book), and *Britain and Ceylon*, 1945; C. R. de Silva, *Ceylon under the British Occupation, 1795-1833: its Political, Administrative, and Economic Development*, 1942; G. C. Mendis, *Ceylon under the British*, 1945. **REFERENCE:** H. W. Cayo, *The Book of Ceylon*, 1908; S. E. N. Nicholas, *Ceylon, the Wonderland of the East*, 1939. **ARCHAEOLOGICAL:** Müller, *Ancient Inscriptions in Ceylon*, 1883-4; H. W. Cayo, *Ruined Cities of Ceylon*, 1897; H. Parker, *Ancient Ceylon*, 1909. **MISCELLANEOUS:** E. H. P. A. Häckel, *A Visit to Ceylon*, 1883; T. Skinner, *Fifty Years in Ceylon*, 1891; R. S. Coplestone, *Buddhism in Magadha and Ceylon*, 1892; Willis, *Ceylon*, 1908; Elsie K. Cook, *A Geography of Ceylon*, 1931; Lord Holden, *Ceylon*, 1945. For language and literature see Alwis, *Sinhalese Handbook in Roman Characters*, 1880; W. Geiger, *Litteratur und Sprache der Singhalesen*, 1901. See also *Annual Report on the Social and Economic Progress of the Peoples of Ceylon* (H.M.S.O.).

Cézanne, Paul (1839-1906), Fr. painter, and the outstanding figure of the post-Impressionist epoch, b. Aix-en-Provence, son of a banker. At first destined for a banking career, in 1862 he forsook his father's business house to study art in Paris. His early canvases were sombre, and romantic in their violence. He was one of the group (which included his boyhood friend Zola) that formed in defence



Department of Information, Ceylon
THE TEMPLE OF THE TOOTH, KANDY

majority considered that the time had come for complete self-gov. on the lines offered to India and Burma. The new constitution was, however, accepted after the Brit. Gov. had issued a White Paper affirming self-gov. as their policy. It had been in existence only a year (June 1947) when the Brit. Gov. announced their decision to make C. a dominion.

C. became a self-governing dominion of the Brit. Commonwealth on 4 Feb. 1948, with the putting into force of the Independence Act, which was passed by the Brit. Parliament in Dec. 1947. The first session of the new Parliament of C. was opened on 10 Feb. 1948 by the Duke of Gloucester under special commission from the king. The Order in Council giving effect to the Independence Act replaced the governor by a governor-general appointed on the advice of the Prime

of Manet, and mainly through the influence of Pissarro he came eventually into the Impressionist circle, exhibiting with them. Impressionism taught him the value of pure colour and of the close study of nature. Little interested in Parisian life, he returned to Aix where the greater part of his life was spent; and after the death of his father he had income enough to disregard the sale of pictures. He set himself the task, as he said, 'to make of Impressionism something solid and enduring like the art of the Old Masters.' His early rather forced style of painting gave way to a method of absolute sincerity. Every brush stroke placed upon the canvas had its part to play in defining the structure of

Roger Fry, *Cézanne*, 1927; J. Meier-Graefe, *Cézanne*, 1927; J. Gasquet, *Cézanne: what he said to me*, 1931; G. Mack, *Paul Cézanne*, 1935; F. Jourdain, *Cézanne*, 1950.

Chaadayev, Pëtr Yakovlevich (1793-1856), Russian thinker. In his 'Philosophic Letter' (1836) he maintained that Russia had no past, no present, and no future save in a reunion with the great body of European civilisation and with the Rom. Catholic Church, and he thus stimulated the great div. in Russian thought between the Westernisers and the Slavophiles. The gov. declared him insane.

Chabas, François Joseph (1817-82), Fr. Egyptologist, b. near Briançon, a wine-merchant by profession, who devoted his leisure to study. C. pub. many valuable treatises in his day.

Chabeuil, Fr. tn in the dept of Drôme, 7 m. S.E. of Valence (q.v.). It is supposed to be the ant. city of Cerebelliaca. There is a silk trade. Pop. 2700.

Chablais, dist. in France, formerly in the Duchy of Savoy (q.v.), now in the dept of Haute-Savoie. It borders on Lake Geneva. Its prin. tn is Thonon.

Chablis, Fr. tn in the dept of Yonne, on the Serein. It is the centre of a famous vineyard producing the great White Burgundy wine, C. Pop. 1700.

Chabot, Charles (1815-82), lithographer and calligraphic expert, b. Battersea. His skill as a calligraphist was much in demand at the law courts; he gave evidence in the celebrated Roupell and Tichborne cases. He identified Sir Philip Francis as being the author of the *Letters of Junius*.

Chabot, François (1759-94), Fr. revolutionary. He was a Capuchin monk who subsequently became a fanatical atheist. In 1790 he became a member of the Constituent Assembly, and gained great influence as an extreme democrat, instigating many of the worst excesses committed by the party, and being noted for his blasphemy and immorality. He was finally guillotined by order of Robespierre.

Chabot, Philippe de (1480-1543), Fr. soldier and Count of Charny and Buzançois. In 1524 he saved Marseilles from the Imperialists, and in 1525 was made a prisoner at Pavia. He was made Governor of Burgundy and admiral of France in 1526, after which he conquered the greater part of Piedmont.

Chabrias, Athenian general. In 390 bc he took part in the Thracian expedition of Thrasylbulus. In 388, on his way to Cyprus to help Evagoras against the Persians, he defeated the Spartans at Aegina. In 378 C. commanded against the Spartans and drove Agostilaus from Boeotia, inventing the famous manoeuvre of receiving a charge on the left knee, with shields resting on the ground and spears levelled at the foe. In 376 he won the naval victory at Naxos; 373, went with Iphicrates to Corcyra; 369, fought against the Thebans in Peloponnesus, repulsing Epaminondas before Corinth; 367-36, was accused of treason over the Theban capture of Oropus, but was



Pruel

CÉZANNE'S 'WOMAN WITH ROSARY'

an object, and it was in his use of colour to express form rather than atmosphere in the Impressionist sense that he initiated a new phase of art. At Aix he painted landscape, portraits, and still-life, but he treated all these branches of painting as still-life. His famous remark after a hundred portrait sittings that he was 'not displeased with the shirt front' sufficiently conveys his lack of interest in anything but the special problems of his art. In later life he painted water-colours that were extraordinarily fresh and brilliant in colour. Derided in his lifetime, he strongly influenced a later generation and his insistence on geometrical structure had its result, not long after death, in the Cubist movement. His 'Montagne Sainte-Victoire' (Courtauld Collection) at the National Gallery is one of his best landscapes, and in 1954 the National Gallery purchased his 'Woman with Rosary.' See E. Bernard, *Souvenirs sur Paul Cézanne*, 1924; A. Vollard, *Paul Cézanne, his Life and Art* (Eng. trans.), 1924; E. Fauro, *Paul Cézanne*, 1926;

acquitted. In the Social war (357) he joined Chares in command of the Athenian fleet, and was killed as trierarch at the siege of Chios. See H. W. Parke, *Greek Mercenary Soldiers*, 1933.

Chabrier, Emmanuel (1841-94), Fr. musical composer, b. Ambert, Puy-de-Dôme. In 1877 he wrote *L'Étoile* (an operetta) and in 1883 *Dix Pièces pittoresques* for the piano. He was chorus master at the Château d'Eau theatre in 1884-5, where he played at concerts. While there he assisted Lamoureux (q.v.) to produce 2 acts of *Tristan und Isolde*. He also brought out *La Sulamite* in 1885, and also selections from his opera *Gwendoline*, which was done as a whole in Brussels in 1886. His orchestral rhapsody, *España*, was a triumph, but the Paris Opera, while accepting his comic opera *Le Roi malgré lui*, rejected his *Gwendoline* as 'Wagnerian.' For his harmonic and orchestral experiments he may be regarded as a forerunner of Debussy and Ravel (qq.v.). When he d. he left his opera *Brietas* unfinished.

Chabron, Marie Etienne Emmanuel Bertrand de (1806-89), Fr. general and politician, b. Retournac, Haute-Loire. He served with distinction in the Crimean War, the It. war, in which he fought at the battle of Palestro, and the Franco-Ger. War of 1870-1, being made a general of div. by Gambetta for the relief of Blois. At the close of the war he was elected deputy for Haute-Loire, and later became a senator.

Chachapoyas, or **San Juan de la Frontera**, city, cap. of Amazonas dept., Peru, situated 80 m. N.E. of Cajamarca. The city dates back to pre-Inca times; to-day it is an important trading centre. Pop. 5500.

Chacma, *Papio porcarius*, largest species of baboon (q.v.), belonging to the family Cercopithecidae (q.v.) and closely allied to the mandrill. It is a native of S. Africa, and in habit it is gregarious. Although largely vegetarian in diet, it is omnivorous at times and is particularly fond of insects.

Chaco, prov. in the C. Austral, Argentine Rep., which is part of the Gran C. (q.v.). Timber-felling is the chief industry, but cattle-grazing and agriculture, lead founding, and tanning are also carried on. The cap. is Resistencia, which is also the governing centre, and is 400 m. N. of Buenos Aires. Area 38,041 sq. m.; pop. 430,600.

Chaco War, between Bolivia and Paraguay. The dispute on the boundaries of the Gran Chaco was of more than 50 years' standing. The first military incidents in the war occurred early in 1927, and by the middle of 1933 hostilities had developed into extensive trench warfare, with aeroplanes and armoured cars. In 1933 the League of Nations Council, on the suggestion of the belligerents, invited Argentina, Chile, and Peru to intervene, it being their opinion that this offered a better chance of solution than mediation by a League commission. But the S. Amer. countries refused the invitation, and hostilities dragged on until Oct. 1935, when a truce was negotiated. After 2½

more years, by which time the resources of both countries, both human and material, were almost exhausted, a peace treaty was drafted in July 1938, under which they agreed to accept the decision of neutral arbitrators on the question of the Gran Chaco boundary. Ratified soon afterwards, the treaty gives Bolivia free commercial transit across the Chaco, and free commercial entry to Puerto Casado on the Paraguay R. Paraguay retained the ter. she had conquered.

Chaconne (Fr.), dance, probably of Sp. origin. Its movements were slow and stately. The music was generally a number of variations on a ground bass of 8 bars; and it differed from the Passacaglia (q.v.) in keeping the theme in the lowest part throughout. Purcell, Bach, Handel, and others of their time wrote C. music, of which the C. of Bach (the last movement of the D. minor Suite or '2nd Partita') for solo violin is the most famous. Lully usually ended his operas with a C., and Gluck still used it to some extent.

Chad, Tchad, or Tead, Lake, or rather 2 large but shallow lakes, surrounded by swamps, situated between Bornu, Bagirmi, Kanem, and Wadai in W. Africa. The lake is studded with is., and the depth is from 8 to 15 ft. It has an estimated area of 7000 sq. m. but the area varies according to the season. Lake Chad gets most of its water from the Shari, but it also gets the waters of the Waube or Yo (otherwise the Komadugu Yobe). In the 19th cent. it was much larger than at present. There are many fish to be found there, and it is also frequented by wild fowl, hippopotami, and alligators. The convention of 1898 gave France the right to the E. shore. There are 2 groups of is., the Kuri archipelago in the S. and the Buduma in the N. They are inhabited by the Buduma and Kuri tribes.

Chad, or **Ceadda**, St (d. 673), b. Northumbria, a follower of St Aidan. He was Bishop of Mercia, with his see at Lichfield. His feast is on 2 March.

Chad, name given to the young of a fish—the common sea bream—by the fishermen of Devon and Cornwall.

Chad Colony, in the Fr. Congo, a ter. with an area of 461,200 sq. m. and a pop. of 2,238,600 natives and about 3359 Europeans. It was formerly a dependency of the Ubangi-Shari colony, but by decree, on 17 Mar. 1920, it was made a separate colony. Great numbers of cattle, sheep, camels, horses, and asses are raised in the colony. Copper, zinc, gold, lead, manganese, corundum, tantalum, and diamonds are found. Ivory is an important export. The French owe the conquest of this region to the activities of Savorgnan de Brazza, who in 1855 led an expedition through Ubangi to Sangha; to Lt. Gentil, who founded Port Archambault; to Commandant Lamy, from whom is named the cap., Port Lamy; and above all to Lt. Binger, from whom is named Binger ville. It is noteworthy that the colony of Chad was the first Fr. overseas ter. openly to support de Gaulle (q.v.) in the Second World War.

Chadderton, par. and tn of Lancs, England, NE. of Manchester. Has important cotton, engineering, and chemical manufs. Pop. 31,500.

Chaderton, Laurence (c. 1536-1640), theologian, b. Lancs; studied theology at Cambridge, in opposition to his father, who wished him to enter the law. In 1584 was chosen by Sir Walter Mildmay as master of the newly refounded Emmanuel College. He assisted in the A.V. of the Bible.

Chaderton, William (c. 1540-1608), Eng. divine. After holding sev. important positions at Cambridge, he became Bishop of Chester in 1579, being also appointed a commissioner for the discovery and conviction of Rom. Catholic recusants. In 1595 he was appointed Bishop of Lincoln, where his efforts were still directed towards conformity.

Chads, Sir Henry Duclie (c. 1788-1868), naval commander, son of a naval captain. In 1810 he took part in the operations off Mauritius, being one of the party that seized the *Île de la Passe* (see W. James, *Naval History*, 1860). First lieutenant of the *Java* under Capt. Lambert when captured by U.S. frigate *Constitution*, 1812. Tried by court-martial for loss of this ship, 1813, but honourably acquitted. He commanded the *Alligator* throughout the first Burmese war, 1826. In 1840-1854 captain of gunnery ship *Excellent* at Portsmouth. Admiral, 1863. His son (1819-1906) was also an admiral. See W. R. O'Byrne, *Naval Biographical Dictionary*, 1849; Montagu Burrows, *Memoir of Admiral Sir H. D. Chads*, 1869; T. Roosevelt, *Naval War of 1812*, 1882.

Chadwell St Mary, par. or Essex, England, including Tilbury (q.v.), on the Thames, containing the E. and W. India deep-water docks. Pop. 12,000.

Chadwick, Sir Edwin (1800-90), social reformer and statistician, b. Manchester. He came to London, studying at the Inner Temple; called to the Bar, 1830. He early studied social, sanitary, and political science, and devoted his life to reforms and prevention of pauperism and disease. In 1828 his article 'On Life Assurance' in the *Westminster Review* appeared; 1829, a paper 'On Preventive Police' in the *London Review*. These won him the notice and friendship of Jeremy Bentham (q.v.). In 1834-47 he was secretary to the Poor Law Commission. From evidence collected for this commission, C. wrote *Report on the Sanitary Condition of the Labouring Population of Great Britain*, 1842. An earlier report of 1833 laid the foundations of later systems of gov. inspection. A public health Act was passed in 1848, and a general Board of Health appointed. C. was a member from 1848 to 1854. He was one of the founders of the Social Science Association, 1878. K.C.B., 1889. The society called Friends in Council (including Rowland Hill, John Stuart Mill, and others) was formed by C. to discuss political economy questions (c. 1844). C. advocated competitive examinations for gov. offices. See Sir B. W. Richardson, *The Health of Nations: a*

Review of the Works of Chadwick, 1887; S. E. Finer, *Life and Times of Sir Edwin Chadwick*, 1952; R. A. Lewis, *Edwin Chadwick and the Public Health Movement*, 1952.

Chadwick, Sir James (1891-), b. Manchester, physicist, master of Gonville and Caius College, Cambridge, since 1948. He worked under Rutherford at Cambridge and took a prominent part in the researches that led to the modern ideas of atomic structure. In 1932 he demonstrated that what had appeared to be a penetrating radiation, produced by bombarding certain light atoms with α -particles, was in fact a stream of particles, of mass similar to that of the hydrogen atom nucleus, but without electric charge. This discovery of the neutron (q.v.) was of immense importance for the understanding of atomic structure, since it soon became apparent that neutrons formed part of the central core or nucleus of all atoms except hydrogen. C. also shared in the discovery of the disintegration of the deuteron by β -rays, and of the creation of a pair of electrons (one positively and the other negatively charged) by γ -rays. He was elected F.R.S. in 1927, and in 1932 he received the Hughes Medal of the Royal Society; in 1935 he received the Nobel prize for physics and was prof. of physics at Liverpool until 1948. At the outbreak of the Second World War he began to study the chain reactions arising during the fission of uranium nuclei, and played a prominent part in the researches that led to the production of the atomic bomb (q.v.). With Rutherford and Ellis he pub. *Radiations from Radioactive Substances*, 1930, revised 1951.

Chaenomeles, family Rosaceae, a genus of 4 deciduous shrubs of N. Asia, closely akin to *Cydonia* (q.v.). *C. speciosa*, formerly *C. japonica* or *Pyrus japonica*, is the Jap. Quince, grown for its scarlet flowers early in the year, and has sev. varieties. *C. japonica* (synonym *C. nautica*) is Maul's Quince, giving fruit excellent for jelly. *C. x superba* is a hybrid of the 2 above species. *C. sinensis* and *C. cathayensis* are Chinese species.

Chaerea, Caius Cassius, Rom. tribune of the praetorian cohorts under Caligula. He formed a conspiracy and assassinated that emperor, AD 41. Shortly afterwards he was executed by Claudius. See Tacitus, *Annales*.

Chaeronea (Chaeroneia), tn in Boeotia, memorable for the defeat of the Athenians, Boeotians, and other Gk forces by Philip of Macedon in 338 bc, and for Sulla's victory over Mithridates in 86 bc. C. was also the bp. of Ptolemy. There are extensive remains, including the marble lion which was erected over the sepulchre of the Boeotians who fell in 338.

Chaerophyllum, genus of Umbelliferae, flourishes in N. lands of temperate climate. *C. temulum*, a biennial, is the Rough Chervil, with rough, purple-spotted stems; *C. aureum* is a perennial, introduced to Britain from S. and central Europe. See *CHERVIL*.

Chaetodon, genus of spiny-rayed fishes of the family Chaetodontidae (butterfly

fishes). The body is laterally compressed and elevated, the snout is fairly long, the mouth is furnished with closely set rows of long, slender, bristle-like teeth, and there is one dorsal fin. The species are often remarkable for their beauty of colour, the commonest tints being black, yellow, and brilliant metallic blues and greens. Their food consists of small animals and green algae. The numerous species frequent coral reefs.



E.N.A.

THE LION OF CHAERONEA

Chaetognatha, small group of transparent, elongated, worm-like animals with the body divided into head, trunk, and tail. The head has a pair of light-sensitive organs and carries 2 groups of chitinous teeth and jaws. The trunk and tail bear lateral fins. The 'arrow worms' or 'glass worms,' as this group is commonly called, consist of about 30 species, nearly all of which are pelagic.

Chaetopoda, class of Annelida, or segmented worms, in which the setae, or bristles, are very noticeable. The chaetopods are divided into 2 orders, the Polychaeta and the Oligochaeta, according as the setae are borne on special processes called parapodia, or spring directly from the body. In the first order all the species are marine, with extremely few exceptions, and in most of them the sexes are distinct, while the second order is composed of hermaphrodite creatures which generally inhabit fresh water or live underground. Among the former may be mentioned the genera *Arenicola*,

the lob-worm; *Aphrodite*, the sea-mouse; and *Chaetopterus*; among the latter occur all the earthworms, e.g. *Lumbricus* and *Megascolides*.

Chaetopterus, genus of polychaet worm which is noted for its green phosphorescent glow. It is a curiously shaped worm which inhabits a long tube.

Chaffer, name applied popularly to beetles of the family Scarabaeidae, which consists of about 13,000 species. The males have horns, and many of the perfect beetles and larvae are destructive to vegetable life. The term is usually compounded with another, e.g. cock-chaffer, barkchaffer, rosechaffer.

Chaffinch, or *Fringilla coelebs*, pretty, active little bird of the family Fringillidae, and is related to the sparrow, canary, and buntings. The cock-bird is a favourite songster, and from his note the Germans call him *finch*, from which we derive the word finch; his specific name is obtained from the habit of the sexes of living apart in winter, the females migrating and leaving the celibate males behind.

Chagall, Marc (c. 1887-), Russian painter, b. Liosno, Vitebsk. Studied painting under Bakst in St Petersburg and (1910-14) in Paris. Worked in Russia during the First World War but returned to Paris, 1922, and migrated to the U.S.A. in 1941. Famous in the School of Paris of the Cubist period, he brought a novel element of fantasy (not to be confused with the later Surrealism). His scenes of Russian folk life are well known. His water-colours illustrating La Fontaine's Fables, etchings for various illustrated works, and theatre designs are other aspects of his work. See studies by T. Däubler, 1922; A. Salmon, 1928; L. Venturi, 1945; and autobiography, 1931.

Chagga, Basuto tribe living on the S. slopes of Mt Kilimanjaro, in Tanganyika. After the First World War they took over many of the former Ger. coffee farms and founded their own coffee co-operative, which is still flourishing. They are one of the most progressive peoples of this ter.

Chagny, Fr. tn in the dept of Saône-et-Loire, on the Canal du Centre. It has a trade in wines, and has pottery and cooperage industries. Pop. 4700.

Chagos Archipelago, scattered group of coral reefs and islets in the Indian Ocean, S. of the Laccadive and Maldivé groups. They lie in circular form round the Chagos bank, in 5° 30' to 6° 30' N. and 71° 30' to 72° 30' E., separated from the Maldivé Is. by a deep channel 300 m. wide. Area about 150 sq. m. A dependency of the Brit. colony of Mauritius. The most important cluster is the Oil Is., with Grand C., or Diego Garcia (q.v.), in the SE. This is. has a good harbour, is a coaling-station, and exports much coconut oil. It is on the route of Australian and Red Sea steamers. Other is. are Danger, Egmont, Eagle, and Three Brothers Is. Various other is. S. and E. of the bank have disappeared. Pop. 5200.

Chagres River, in Panama, Canal Zone. Rising in San Blas Mts, about 30 m. from

Panama, it flows SE. through Lake Madden to the Panama Canal; it forms part of the canal from Gamboa to the W. of Gatúa, and flows NW. into the Caribbean Sea. Navigation, except where it is canalised, is hindered by its falls and extreme swiftness. The Panama railway follows a part of its course.

Chaguaramas, inlet on NW. peninsula of Trinidad (q.v.), Brit. W. Indies, a bay on which is situated a U.S. naval base, 8 m. NW. of Port of Spain. The cap. of the new Caribbean Federation (q.v.) is to be on Trinidad, and it was strongly recommended that C. should be the chosen site.

Chahar, formerly a prov. of Inner Mongolia, China; now part of the Inner Mongolia Autonomous Region.

Chailié-Long, Charles (1842-1917), African explorer of Fr. parentage, b. Baltimore, graduated at Washington Academy, 1860; studied law at Columbia, becoming barrister, 1880; served in the Confederate army, 1862-5; went to Egypt and was made lieutenant-colonel by the khedive, 1870. In 1874 he became chief to Gordon's staff, and went on a mission to King Mtesa of Uganda. Obligated owing to plots to return to Gordon at Gondokoro, he managed to explore Lake Victoria and the country round, the course of the Somerset Nile, and Makaraka and Nyan-Nyan countries. He was decorated with many medals and honours for services as explorer and soldier. Among his works are *Les Combattants français*, *Les Sources du Nil*, *L'Égypte et ses provinces perdues*, *Central Africa: Naked Truths of Naked People*, 1876, *The Three Prophets*, 1886, and *My Life in Four Continents*, 1912.

Chailloteaceae, obscure family of Dicotyledons flourishing in the tropics. The inflorescence is cymose, the flowers are hermaphrodite or unisexual, the calyx, corolla, and androecium are in parts of 5, the gynaeceum consists of 2 or 3 united carpels, and the fruits is a drupe.

Chaillet, dist. in Paris, on the r.b. of the Seine, opposite the Eiffel Tower, formerly a vil. dating back to the 7th cent. In a mansion here (on the site of the present palace) built by Catherine de' Medici, Henrietta Maria (q.v.), queen of Charles I of England, founded a famous convent. On the same site, Napoleon ordered to be built the 'most vast and extraordinary palace' in the world, but it was uncompleted at his fall. The site is now occupied by the Palais de C., a huge building reconstructed for the international exhibition of 1937 out of the Palais du Trocadéro, built for the exhibition of 1878.

Chailu, Paul du, see DU CHAILLU.

Chain, Ernst Boris (1906-), biochemist, b. Berlin and educ. at the univ. there. He graduated 1930 and emigrated to England in 1933. C. carried out research at Cambridge (1933-5) and Oxford, in which latter he was univ. demonstrator and lecturer in chemical pathology, 1935-50. At Oxford he was associated with Sir H. W. Florey (q.v.) in the development and clinical application of penicillin; for this work he shared the Nobel prize for medicine in 1945. Since 1950 he has been prof. of biochemistry and scientific

director of the International Centre for Chemical Microbiology, Istituto Superiore di Sanità, Rome.

Chain, Chain Cables (Lat. *catena*), series of links of metal, or other material, so connected as to form a flexible band. C.s. are of very anc. origin, but the number of different uses to which they can be put has been largely increased in modern times. Some of the oldest uses are as ornament (collar, bracelet, cf. modern watch C.), as a symbol of office (cf. modern knight, mayor), and as fetters for prisoners or slaves, hence any kind of shackle or bond, or figuratively a restraining force. Cordage was used for many purposes now served by C.s. They are employed to confine, bind, fasten, or connect together various objects, to lift weights, to transmit a mechanical power. These last are known as pitch C.s. In some C.s. the links are composed of a single piece of metal (oval-link hoisting C.), in others the links are made up of sev. separate pieces (bicycle C.). These pieces are connected by bolts, rivets, or stud-screws, and are so formed as to engage with the teeth of a sprocket wheel.

C.s. differ very considerably in structure according to the shape of the links (stud C.s., open-link C.s., twisted-link C.s.), the mode of uniting them, and the purpose for which they are intended. They are sometimes loosely divided into hand-made and machine-made C. Ornamental C.s. may have a large variety of links, but those for useful purposes are mainly of 2 types: (1) stud C.s., in which a transverse stud or brace is inserted in each link to keep the sides from collapsing under strain; (2) open-link C.s. with no stud. The first are much stronger, increasing the load a C. can bear by about 50 per cent. Small C.s. are often made by machinery, but larger ones are usually made by a smith and entirely hand-wrought. Crane C.s. and ships' cables, etc., are generally hand-made from rolled bar-iron. The weld is commonly at the end of the link, but for large cables presses may be used to bend the link, or power hammers for welding, the weld sometimes being at the side. Weldless C.s. are machine-made ones, manuf. from cruciform steel bars pressed while hot into links with no join (Strathern's process). They are mostly made in small sizes for cow-ties, dog C.s., or fence C.s. Strong C.s. can withstand a breaking strain of many tons. C. cables have to undergo severe tests before passed by the Brit. Admiralty for use on board ship. C.s. for railways, cranes, dredges, etc., have similar tests. Size is defined by the diameter of the bar from which the links are made. A 2-in. stud C. cable must withstand test load of 72 tons. For full 'test requirements' see Kent, *Mechanical Engineer's Pocket Book*. As a nautical term C. means the contrivance to extend the basis of the lower shrouds of a mast, consisting of dead-eyes, C.-plates, and C.-wale ('channel').

Chain, or Gunter's Chain, measuring-line in land surveying, of 100 links, connected by oval rings, with a brass handle

each end of the C. The total length, to the outside of the handles, is either 66 ft (Gunter's C.) or 100 ft. At every 10 ft or link a brass tag is fixed. Ten square (Gunter's) chains = 1 acre.

Chain-mail, see ARMOUR and MAIL ARMOUR.

Chain-plates, in shipbuilding, strong plates or bands of iron fastened to the ship's side under the chainwale, to which are attached the dead-eyes or (more recently) rigging-screws, to which the standing rigging and shrouds are fastened. In architecture a series of connected plates built into walls to give greater strength.

Chain Reaction, see ATOMIC BOMB and THERMO-NUCLEAR REACTION.

Chain-shot, obsolete form of projectile, invented by Adm. de Witt in 1666, consisting of 2 balls connected by a chain or bar, and used to destroy the rigging of enemy ships.

Chained Books. The custom of chaining books to stands or reading-desks was very common in various parts of Europe in the 15th and 16th cents. A library fitted with reading-desks made with an iron rod along the top to which the books were fastened by a chain was founded at Zutphen, 1561, and is still to be seen. Later, as the number of books increased, upright book-shelves were set up (very much as in modern libraries) and the books so arranged in them as to show the fore-edges on which the titles were written. Sloping desks were placed in front of the shelves, and chains were fastened to the books long enough to allow of their being placed and consulted on the corresponding desks. All Saints' Church, Hereford, still has a library of this kind dating from 1715. Hereford Cathedral library is an earlier example of the same system. In the reigns of the Tudor kings Henry VIII and Edward VI, orders were given for Bibles and copies of the Paraphrases of Erasmus to be chained in the par. churches. These books, together with Foxe's *Book of Martyrs* and works of Jewell (d. 1571), may still be found in old churches with their chains attached to them. The practice was discontinued early in the 18th cent. It was doubtless first introduced because the scarcity of books made them very valuable. See W. Blades, *Books in Chains*, and other *Bibliographical Papers*, 1892, and J. W. Clark, *The Care of Books*, 1901.

Chair, see FURNITURE.

Chairman, presiding officer at the meeting of any assembly, association, or company, whether convened for public purposes or for the transaction of the private business of the members. When a meeting is assembled the first thing to be done is for the chair to be taken. Some person present may have a statutory right to preside, and in the case of many public meetings the name of the C. is previously announced in the notice convening the meeting. In the absence of the foregoing, or where the C. selected by the convenors of the meeting is challenged, the meeting should put the call to the chair to vote. The president

or C. of the House of Commons is elected at the beginning of every new Parliament, and is called the Speaker. The prin. function of a C. is the maintenance of order, and on taking the chair a C. is consequently invested with authority to control and regulate the proceedings of the meeting. Generally speaking the duties of a C. are to decide points of order, put motions to the vote, call upon speakers to address the meeting, regulate the discussions, call upon the stewards or managers (if any) or the members themselves to eject interrupters without unnecessary violence, sign and secure the proper framing of the minutes, and adjourn the meeting. The Speaker of the House of Commons gives rulings as to procedure, names members guilty of disorder, reprimands members and other persons, if necessary, and signs warrants of committal for contempt. Speakers at a meeting must always address the chair. Unless previously selected to speak, when he will be called upon to do so by the C., a member desiring to speak must rise at the end of another member's speech. If 2 or more rise simultaneously, the one that 'catches the C.'s eye' should be called upon; but the C. may call upon whom he will. The office of C. may not be an easy one to fill. The ideal qualities in a C. are urbanity, the most unimpeachable impartiality, and a clear perception of the fundamental rules of debate. In calling speakers to order his function is to keep a discussion within legitimate or relevant bounds. In the case of meetings of public bodies it is obvious that public time can only be saved by confining speeches to the questions on the agenda. The C. is the sole judge as to whether any speech, resolution, or amendment is in order. When any resolution or amendment is proposed and seconded the C. is bound to put the resolution or amendment to the vote. Where the voting is equal the C. may have a second or casting vote. See W. M. Citrine, *ABC of Chairmanship*, 1953.

Chairman of Committees, officer who takes the chair in the House of Commons when the House is in Committees. He holds office during the whole Parliament. He does not sit in the Speaker's chair, but at the table in the place normally used by the Clerk. To the C. of C. belongs the duty of superintending all matters relating to private Bills. The salary of the C. of C. is £2500 a year. When the Speaker of the House is absent the C. of C. takes his place. There is also a deputy chairman. The corresponding officer in the upper House is called the Lord C. of C. See HOUSE OF COMMONS.

Chaise (Fr. *chaise*, chair), light, wheeled vehicle. C. is sometimes loosely used for any kind of pleasure carriage, but it is usually a 2-wheeled carriage for 2 people, with a calash top and the body hung on straps, drawn by 1 horse (cf. *hansom*). The post-chaise of the 18th and 19th cents. was a closed, 4-wheeled vehicle, with 2 or 4 horses.

Chaitanya, Indian mystic (d. c. 1486-1570). Founder of the Vaishnava sect

of Bengal. Regarded by his adherents as Krishna incarnate.

Chalaza, in botany the base of the nucellus of the ovule, a mass of parenchymatous tissue from which the integuments arise.

Chalcedon, properly **Calchedon** (mod. Kadiköi), anct Gk city of Bithynia on the Bosphorus, opposite Byzantium, S. of Scutari. It was a Megarian colony, founded 685 bc. For long it vacillated between Athenian and Lacedaemonian interests. Attalus III of Pergamum bequeathed it to the Romans, 133 bc. Partly destroyed by Mithridates, it was recovered under the empire. C. was frequently ravaged by barbarian hordes, such as the Goths (AD 256) and Persians under Chosroes (AD 616-26). In AD 451 the fourth general council was held here. C. was destroyed by the Turks after 1075.

Chalcedony, or **Calcedony**, precious stone of the commoner sort, deriving its name from Chalcedon, a city of Bithynia in Asia Minor. The anct mineral, however, appears to have been a green stone, whereas modern C. is a milky-white or yellowish stone consisting of silica. It differs from quartz in not being definitely crystalline, but occurs in concretionary, mammillary, or stalactitic forms with a fibrous structure. Its hardness is 6½ and sp. gr. 2.6. It occurs in cavities in volcanic rocks, where it has been deposited out of solution in water, as in the basalt of N. Ireland, Iceland, the Faroe Isles, etc. It is widely distributed, excellent specimens being found in Uruguay, Brazil, and the Lake Superior dist. Occasionally specimens are found with a drop of water in the interior, and these are much prized as ornaments. C. has been worked by jewellers from early times, and variegated forms are differentiated as agate, onyx, jasper, bloodstone, carnelian, etc.

Chalcedonyx is a specially marked variety of chalcedony, a mineral composed of quartz of a milk-white colour caused by the presence of opal. It usually has greyish markings, which give it, when polished, an ornamental value; it is used for making brooches and vases.

Chalchicomula, see SERDÁN.

Chalchihuitl (Chalchuite), Mexican name for a kind of green, fine-grained stone, quarried near Santa Fé, much prized by the anct Mexicans. Probably it was a green variety of turquoise, or else a kind of jade. It was valued above gold, used for carved sculpture and polished, or made into beads and ornaments. Figures were found in tombs, and the brooch fastening Montezuma's robe was of C.

Chalcides, name of a genus of lizards in the family Scincidae. The species are pleurodont lizards with bony plates on the head and body, a scaly and feebly hooked tongue, elongated and sometimes serpentine body, the limbs wanting or little developed, and the lower eyelid has a transparent disk. They inhabit SW. Asia and the Mediterranean. *Ch. ocellatus* attains a length of about 10 in.

Chalcis (Negropont), anct seaport of Greece, cap. of Euboea, on the Euripus at

its narrowest part and 17 m. from Thebes, 35 m. from Athens, to which it was subject in 5th and 4th cents. bc. In early times it was a flourishing seat of commerce and manufs. (metal-work, purple, pottery), and a great colonising centre. The 3-pronged peninsula of Chalcidice, projecting from Macedonia into the Aegean Sea and divided into Pallene, Sithonia, and Acte (with Mt Athos), took its name from colonists in the 8th cent. bc from C., and its tns, Olynthus and Potidea, were famous in Gk hist. Cumae and Naxos were also colonised from there. In the 7th cent. it defeated Eretria in the Lelantine war, becoming chief city of Euboea. Both Antiochus III (192 bc) and Mithridates VI (88 bc) used C. as a base for invading Greece. Aristotle d. here. C. was important in the Middle Ages; called Egridio by the Greeks, Negroponte by the Italians. It has medieval walls and towers, buildings of Venetian construction, and mosques mostly converted into Christian churches. In 1894 an earthquake did much damage. Since 1904 a railway connects C. with Athens and Piræus. Pop. about 11,000.

Chalcids, typical genus of the curious suborder of hymenopterous insects, Chalcidoidea. The family contains numerous species of tiny parasites which prey on the larvae of galls, on caterpillars, on bees and beetles, but also on many destructive insects and they are thus of considerable value to man. *C. flavescens* is a species which is native to tropical America, and certain hymenopterous insects of the allied genera *Blastophaga* and *Sychophaga* assist in caprification or the fertilisation of the cultivated fig.

Chalcocondylas (or **Chalcocondyles**), **Demetrius** (1424-1511), Gk grammarian, b. Athens; brother of Laonicus. On Lorenzo dei Medici's invitation he went to Florence, where his pupils included Grocyn, Linacre, and Latimer (1480-92). He was also prof. of Greek at Perugia, Rome, and Milan. The first printed ed. of Homer (1488) was ed. by C.; his Gk grammar, *Erotemata*, appeared about 1493. C. also ed. Isocrates (1493) and Suidas (1499). See J. A. Symonds, *Renaissance in Italy*, 1875-80, 1920.

Chalcocondylas (or **Chalcondyles**), **Laonicus** (c. 1432-c. 1490), Gk historian, educ. by Plethon (q.v.) at the court of the Palaeologi at Mistra. He wrote a hist. covering the years 1298-1463, the plan of which is modelled upon that of Herodotus, though the style and language are clearly an approximation to those of Thucydides. There is a critical ed., *Historiarum demonstrationes*, by E. Daskö (2 vols., 1922-7); but no Eng. trans. of this masterly work exists.

Chaldaea, **Chaldaeans**, general description in O.T. and late Assyrian texts for the whole of Babylonia and its inhab. C. strictly applies to the land between the head of the Persian Gulf (marshland), the desert of Arabia, and the R. Euphrates. The prin. city, Bit-Yakin, was the base from which Merodach-Baladan (q.v.) conquered Babylon (703-702 bc) and defed Sargon II and Sennacherib (qq.v.) of

Assyria. A strong Chaldaean dynasty, ruling an independent Babylonia, was founded by Nabopolassar in 605 BC and displaced by Cyrus in 539 BC. Throughout this period C. became synonymous with Babylonia and its Semitic language, which was closely allied with Aramaic which language superseded it. Through a misunderstanding Aramaic has, until recently, sometimes been called 'Chaldee.' Chaldaean also designates the learned classes (astronomers, etc.) of Babylon as in Daniel, Herodotus, Diodorus, and Strabo. Xenophon's 'Chaldaeans' (*Anab.* vii) were the Hadaeans or Urartians of Armenia. See D. J. Wiseman, *Chronicles of Chaldaean Kings* (626-556 BC), 1956. See also BABYLONIA and UR.

buried in the Friends' cemetery near by. Milton lived here during the plague (1665-1666), and finished *Paradise Lost* and began *Paradise Regained*. His cottage is shown daily except on Tuesdays. Pop. 4460.

Chalford, eccles. dist. and vil. of Glos., England, 4 m. from Stroud, picturesque hillside vil., accessible only through a maze of winding and narrow lanes. Pop. 3000.

Chalgrove (A.-S. *cealc-graef*, chalk-pit), par. and vil. of Oxon., England, about 11 m. from Oxford. In 1643 the Parliamentarians were crushed here by the Royalists under Prince Rupert, Hampden being mortally wounded. The chancel of the par. church, which dates from the



SWISS CHALETS AT ZUM-SEE, NEAR ZERMATT

Topical

Chalder, old Scottish dry measure of 16 bolls or 64 firloths of corn (96 bushels). For lime or coal it varied from 32 to 64 imperial bushels. Still used in computing the stipends of Scottish ministers (cf. Chaldron).

Chaldron, see METROLOGY.

Chalet (dimin. of O.F. *chastel*; Mod. Fr. *château*), originally a wooden hut or cabin in the Swiss mts. where cattle are lodged in summer, and cheese is made. Extended to a Swiss peasant's small cottage, a herdsman's hut, or a wooden house. Applied now to any picturesque villa built in imitation of that style.

Chaleurs Bay (*Baie des Chaleurs*), sheltered inlet of the Gulf of St Lawrence, Canada, between Gaspé Peninsula and New Brunswick. Quebec is on the N., New Brunswick on the S. The bay is about 90 m. from E. to W., maximum breadth 25 m. There are good mackerel fisheries. Shippegan and Miscou Is. are near the entrance. Discovered by Cartier in 1535, it was named from the intense heat of the summer season.

Chalfont St Giles, par. of Bucks, England, 4½ m. NE. of Beaconsfield. Penn is

12th cent., contains some interesting frescoes, covered during the Civil war, but brought to light again about a hundred years ago.

Chaliapin, Feodor Ivanovich, see SHALIAPIN.

Chalibaus, see CHALYBAEUS.

Chalice (Lat. *calix*), drinking-cup, goblet, or bowl, but especially the cup used at Mass and in the Anglican Communion service. Formerly it was made of any material (the 'Luck of Edenhill' preserved in the family of Musgrave, near Penrith, is of glass), but must now be of gold, silver, or silver-gilt, with the inside gilded, and consecrated by a bishop. It should be handled only by those in holy orders.

Chalina, genus of Porifera, received its name from the naturalist Grant. The sponge is represented in Britain by *C. oculata*, the mermaid's glove.

Chalk, soft, white variety of limestone. As found in the S. and E. of England, it is white or yellowish-white in colour and easily broken, though it varies considerably in compactness. Flints of various sizes are found embedded in the C.,



The Worshipful Company of Goldsmiths

CHALICE

16th-century silver-gilt chalice and paten from St Ethelburga's Church, Bishopsgate, London.

usually in fairly definite layers; otherwise it consists of calcium carbonate, with some admixture of silica, alumina, and magnesia. C. consists largely of the hard parts of organisms known as coccoliths, forms of which inhabit warm seas at the present day; calcium carbonate secreted by these animals was deposited on the sea bed as they died. From this calcareous ooze, C. has consolidated. Rocks resembling C. were formed during the Tertiary Period and are exposed in the Near E.; despite these and other occurrences, it remains true that the great period in which C. was laid down was the Cretaceous (named after the Latin for lime). The Cretaceous C. was laid down in warm seas which occupied much of what is now N. France, S. Britain, and Germany. C. also occurs in Ireland and Denmark. In Britain the C. outcrops in a broad belt running SW. from the Yorks Wolds; in this belt it gives rise to a characteristic landscape with rounded hills, often covered with downs of short herbage which can tolerate the chalky soil; near Salisbury Plain the outcrop widens and from here 2 arms stretch eastwards forming the N. and S. Downs. The sea cliffs of C. are a striking feature of the Channel coast. The C. is used for building purposes when found hard enough, and the flints are used for building and road-making. When subjected to a bright heat, C. loses its carbon dioxide, and calcium oxide, or quicklime, is formed. When mixed with water the hydrate, or slaked lime, is produced, and this, mixed with 3 times its bulk of sand, forms the mortar used to cement bricks together. Lime is also much used as a fertiliser and

is particularly valuable in acid soils. C. burnt with certain proportions of clay provides different forms of cement, which harden with more or less rapidity according to the proportions of their constituents. When the C. is triturated with water, and the fine particles allowed to fall in a fairly homogeneous mass, the resulting product is whiting, used as a pigment and a polishing medium. An artificial C. is prepared by adding sodium carbonate to a solution of calcium chloride, when a fine precipitate forms. This product, known as precipitated C., is used in medicine as an antacid and astringent, and serves as a tooth-powder and as a pigment. Substances somewhat similar in consistency to the carbonate are known as C.s. *Black C.* is a soft schist containing carbon; *red C.* consists of iron ore and clay; *French C.* is a variety of steatite, or soapstone.

Chalking the Door, mode of giving tenants notice of removal (especially among the poorer classes) formerly common in Scotland. The chalk mark was made by a burgh officer in the presence of witnesses on 'the most patent door,' on the proprietor's verbal order. This was done 40 days 'before Whit Sunday,' or the date on which the tenants were expected to leave. When this had been done, and a declaration of 'chalking' written out and signed by the officer and 2 witnesses, he might demand the ejection of the tenants 6 days after the expiry of the 40 days.

Chalkley, Thomas (1675-1741), Quaker. After a varied and adventurous youth, he began preaching at Quaker meetings, and in 1697-8 visited the Puritan Amer. colonies. In 1700 he returned to America; in 1701 made a preaching tour to the Barbados, and between then and 1710 visited Ireland, Scotland, England, Holland, and Germany. The rest of his life was mainly spent in preaching and organisation in America, where he had great influence. His *Journal* and works appeared in 1751 and 1790.

Challemeil-Lacour, Paul Armand (1827-1896), Fr. writer and statesman, b. Avranches, became prof. of philosophy at Pau and Limoges. In 1868 he estab. the *Revue Politique*, with Brissot and Gambetta, who made him prefect of Lyons, 1871; deputy, 1872; senator, 1876; ambas. to Switzerland, 1879; to England, 1880-1882. In 1883, under Ferry, he was minister of foreign affairs, in 1890 becoming vice-president, and in 1893 president of the Senate. Member of the Fr. Academy, 1893. He wrote a large number of philosophical works.

Challenge, see **JURY**.

'Challenger' Expedition, scientific exploring expedition sent out by the Brit. Gov. (1872-6) for experiments in deep-sea soundings and the investigation of the conditions of life in the Atlantic, Pacific, and Antarctic Oceans. The cruise of H.M.S. *Challenger*, the first steam vessel to cross the Antarctic Circle, followed that of the *Lightning* in 1868, and of the *Porcupine*, 1869-70. Capt. G. S. Nares was naval commander of the vessel, the

scientific staff being under Prof. Wyville Thomson. Every kind of scientific appliance was supplied for sounding the depths, mapping the basins, and determining the physical and biological conditions of the oceans. H.M.S. *Challenger* reached Santa Cruz in Feb. 1873. Investigations were made at 362 stations. Among numerous places on the route were Madeira, Canaries, W. Indies, Nova Scotia, Cape Verde, Fernando Noronha, Cape of Good Hope, Melbourne, Hong Kong, Japan, Valparaiso, Magellan Straits, Portsmouth, and various sub-arctic is. The deepest sounding was between Admiralty Is. and Japan, 4675 fathoms. See *Official Reports on the Scientific Results of the Voyage of H.M.S. 'Challenger'*, ed. by Wyville Thomson and John Murray, 50 vols. (Zoology, Botany, Deep-sea Deposits, Physics, and Chem., etc.), 1880-95. The narrative occupies 2 vols. (1882-5). Consult also H. N. Moseley, *Notes by a Naturalist on the 'Challenger'*, 1872-76, 1879; W. J. J. Spry, *Cruise of H.M.S. 'Challenger'*, 1876; and works of W. Thomson, J. Murray, Lord George G. Campbell, and J. J. Wild.

Challis, James (1803-82), astronomer and physicist, b. Braintree, educ. at Trinity College, Cambridge. Senior wrangler, first Smith prizeman, 1825; ordained, 1830. In 1836 Plumian prof. of astronomy and experimental philosophy, and till 1861 director of the observatory of Cambridge Univ. His labours were largely directed to determining the positions of the sun, moon, and planets, so as to increase tabular accuracy. Among his valuable improvements were the collimating eye-piece (1850), the transit-reducer, and the meteoroscope. His works include *Astronomical Observations, 1828-45, 1829-50; 1846-51, 1854-6; and An Essay on the Mathematical Principles of Physics*, 1873.

Challoner, Richard (1691-1781), Eng. Rom. Catholic priest, educ. at the Eng. college at Douai, 1704; prof. of philosophy there, 1713-20; vice-president and prof. of divinity, 1720-30. C. returned to London, becoming coadjutor to Petre, 1741, succeeding him in 1758 as vicar apostolic of the London dist. He was appointed titular Bishop of Debra in Libya, 1741. During the Gordon riots he took refuge in Highgate. His pub. works include *Church History, Grounds of the Old Religion, The Garden of the Soul, 1740, The Rheims New Testament and the Douay Bible, with Annotations, 1749-50*. His version of the Douai Bible is substantially that since used by Eng.-speaking Catholics. C. also trans. *The Imitation of Christ*, 1706. See *Barnard's life*, 1784, also E. H. Burton, *Life and Times of Bishop Challoner*, 1909.

Chalmers, Alexander (1759-1834), biographer and editor, b. Aberdeen. He studied medicine, but turned to journalism, ed. newspapers in London, contributed to periodicals, and wrote prefaces for new eds. of Eng. classics. His *Glossary to Shakespeare* appeared in 1797. His *British Essayists*, in 45 vols., 1817, is still useful. His fame rests chiefly on his

General Biographical Dictionary in 32 vols., 1812-17.

Chalmers, George Paul (1833-78), painter, b. Montrose; in early life a surgeon's errand-boy, then apprenticed to a ship-chandler. He studied art in Edinburgh, Orchardson, Graham, Pettie, and others being among his fellow students. His landscapes were considered his best work, including 'The End of the Harvest,' 1873, 'Running Water,' 1875, and 'The Legend' (Edinburgh National Art Gallery). See *Art Journal*, April 1873, and *Memoir*, 1879.

Chalmers, James (1841-1901), missionary, served in Glasgow City Mission, passed through Cheshunt College, and was appointed by the London Missionary Society (1866) to work in Raratonga Is. in the S. Pacific. He worked there for 10 years, training native evangelists, and was called Tamate by the natives. Then he was transferred to New Guinea. Besides zealous missionary work, C. and Lawes (his colleague) opened up the land, and helped in establishing the Brit. protectorate. C. and Tomkins (another missionary) were murdered by cannibals at Goarbari Is. See Lt. L. Stevenson, *Letters*, II. 212, 220, and J. Chalmers: *Autobiography and Letters*, ed. by Lt. Lovett, 1902.

Chalmers, Thomas (1780-1847), theologian and economist, one of the most eminent figures and influential preachers of the 19th cent. His powers of oratory were so great that Jeffrey ranked him with Demosthenes, Cicero, Burke, and Sheridan. Educ. at St Andrews Univ., he began preaching at 19. From 1803 to 1815 he was minister of Kilmany, Fife. He then gave much time to studying mathematics, political economy, and natural philosophy; but after reading Willberforce's *View of Practical Religion*, and writing at his request the article on Christianity for Brewster's *Edinburgh Encyclopedia*, 1810, his religious enthusiasm awoke, and he became an enthusiastic pastor. In 1815-20, as minister of Tron par., Glasgow, he tried to remedy the ignorance and vice of his par., making experiments in parochial organisation which anticipated modern methods as seen in charity organisations and in settlement work (see N. Masterman, *Chalmers on Charity*, 1900). C. divided the par. into 25 dists., and estab. 2 week-day and numerous Sunday schools. His *Astronomical Discourses* appeared in 1817, and were very popular. His visit to London was enthusiastically received. His *Christian and Civic Economy of Large Towns* appeared from 1821 to 1826. These energetic labours told on his health. In 1823 he became prof. of moral philosophy at St Andrews; 1828, of theology at Edinburgh. In 1827 appeared the *Use and Abuse of Literary and Ecclesiastical Endowments*; in 1834 his Bridgewater treatise, *Adaptation of External Nature to the Moral and Intellectual Constitution of Man*, which won him great distinctions from Edinburgh, France, and England (D.C.L., Oxford). In 1829 C. spoke in favour of Catholic emancipation. He

was elected moderator of the General Assembly of the Scottish Church, and convener of the church-extension committee (1834). Cases of conflict between the church and civil authority arose in Auchterarder, Dunkeld, and Marnoch. In 1843, owing to these internal troubles, 470 clergymen, headed by C., left the church and founded the Free Church, claiming for it spiritual independence. C. was made principal of the Free Church College. He devoted much time to the attempt to abolish pauperism round about Edinburgh. His last work was *Institutes of Theology*. His works were collected by W. Hanna, 1836-40, and posthumously 1847-9. See R. Buchanan, *The Ten Years' Conflict*, 1849; W. Hanna, *Memoirs*, 1849-52; Taylor Innes, *Law of Creeds in Scotland*, 1867; Mrs T. C. Oliphant, *Thomas Chalmers*, 1896; W. G. Blaikie, *Life*, 1897.

Châlon-sur-Saône (anc. Cabillonum), Fr. tn, cap. of an arron., in the dept of Saône-et-Loire, on the Saône and the Canal du Centre. It has extensive water-borne trade with the Atlantic and the Mediterranean. It is a wine market, has iron and copper foundries, engineering and ship-building works, brewing, and sugar, glass, and chemical manufs. Pop. 32,700.

Chaloner, Sir Thomas (c. 1521-65), diplomat and writer, b. London and edgew. at Oxford. He was sent by Henry VIII as ambas. to Charles V. whom he accompanied in his disastrous expedition against Algiers, 1541. Later C. was recalled to England as chief clerk of the Privy Council; he was knighted in 1547. Elizabeth I employed him as ambas. to the Emperor Ferdinand I, 1558, to Philip II at Courtray, and as minister at the Sp. court, 1561. Among his literary works is a trans. of Erasmus's *Praise of Folly*, 1549.

Chaloner, Sir Thomas (c. 1561-1615), naturalist, son of the statesman, father of Edward, James, and Thomas the regicide. In 1603 he was appointed director of the education and household of Prince Henry. He opened the first Eng. alum-mines at Belman Bank, Guisborough, about 1600.

Châlons-sur-Loire, tn in the dept of Maine-et-Loire, France, 12 m. SW. of Angers. The chief trade is in wines, grain, and limestone. There are mineral springs in the neighbourhood. C.-sur-L. possesses the ruins of a 12th-cent. chateau. Pop. 3800.

Châlons-sur-Marne, Fr. tn, cap. of the dept of Marne, on the r. b. of the Marne. It was known to the Romans as Catalaunum. From the 10th cent. to the 14th cent. it was governed by its bishops. It suffered at the hands of the English in the Hundred Years War. In 1589 Henry IV (q.v.) transferred the parlement of Paris here when the tn sided with him. Taken by the Germans in 1870, when MacMahon (q.v.) withdrew from the famous camp of C.-sur-M. formed by Napoleon III in 1856 (see FRANCO-GERMAN WAR), and was again in Ger. hands for a short period in the First World War. The tn, including the 13th-cent. cathedral, was severely damaged in the Second World

War. There are many old houses, and a 12th-cent. church, Notre-Dame-en-Vaux, and the tn is the seat of a bishop. C.-sur-M. is an important railway junction, and a centre of the wine trade of Champagne. It also has leather, oil, and textile manufs. It was formerly noted for its worsted cloth called 'shalloon' (called 'chalons' by Chaucer). Pop. 31,000. See also CATALAUNIAN FIELDS.

Châlus (Castrum Lucii), Fr. tn in the dept of Haute-Vienne, on the Tardoire. It has a ruined castle on a hill, besieging which Richard I, Cœur-de-Lion (q.v.), was mortally wounded. Pop. 2100.

Chalybæus (Chalybæus), Heinrich Moritz (1796-1862); Ger. philosophical writer. From 1839 until 1852 he was prof. of philosophy at Kiel Univ. where, with the exception of one brief interval, he remained till his death. In 1836 he pub. *Historische Entwicklung der spekulativen Philosophie* (Kant to Hegel). But his chief works are *Entwurf eines Systems der Wissenschaftslehre*, 1846, and *System der spekulativen Ethik* (2 vols.) 1850. His general principle, 'ideal-realism,' rejects both the extreme realism of Herbert and what he regards as the one-sided idealism of Hegel, and he tries to find a mean between the two. He defines the 'world other' as the infinite in time and space and which in his view must be postulated as necessarily coexisting with the Infinite Spirit or God.

Chalybeate Springs are natural mineral springs in which iron predominates, as at Harrogate and Leamington Spa, England. The iron is generally combined with carbonic acid, in the form of protoxide or proto-carbonate, or with sulphuric acid, in the form of sulphate of iron, and the springs, therefore, can be subdivided into carbonated chalybeate and sulphated chalybeate.

Chalybes (Gk *Chalubes*, from *Chalups*, iron), Asiatic people who lived in Pontus, Asia Minor, SE. of Black Sea. Famed as ironworkers, whence our word 'chalybeate.' Also a people mentioned by Xenophon as dwelling in the mts on the borders of Armenia and Mesopotamia.

Chalybite, see SIDERITE.

Cham (Fr. for Ham, son of Noah) (1819-84), pseudonym of the brilliant caricaturist, Amédée Charles Henri, Vicomte de Noé. He studied under Delaroche and Charlet, and won fame for depicting the humorous side of contemporary Parisian life, his first album, *Calembours, blâmes, jeux de mots tirés par les cheveux*, appearing in 1842. In 1843 he first became connected with *Charivari*, and in this and the *Journal des Pèlerinages* his drawings continued to appear till his death. His masterpieces are chiefly social, but he also did political cartoons. Among his skits are *Proudhomanie*, *Baigneurs et buveurs d'eau*, *L'Exposition de Londres*. For collections of his comic sketches see *Deux années comiques*, 1880, *Les Folies parisiennes*, 1883. There are also examples in G. A. Sala's *Paris Himself Again* in 1878-79, 1882. See F. Ribeyre, *Cham, sa vie et son œuvre*, 1884.

Chamaecyparis, genus of hardy, evergreen coniferous trees, closely related to and often included under Cupressus; family Pinaceae; sometimes known as Bastard or False Cypress, and chiefly from N. America, Formosa, and Japan. *C. lawsoniana*, Lawson's Cypress, is very variable; *C. nootkatensis*, *C. obtusa*, and *C. pisifera* are valued for forestry and ornamental gardening. See CYPRESS.

Chamaeleon, small S. constellation near the S. pole S. of Carina and Musca, announced by Bayer in 1603.

Chamaerops, family Palmaceae, Palm genus of 1 species, *C. humilis*, native to Mediterranean region, and only palm native to Europe. An evergreen shrub, with fan-shaped leaves, it is a popular greenhouse foliage plant, with many varieties; and may be grown outdoors in mild localities in Britain.

Chamba, tn and area in India, formerly an Indian state, now part of Himachal Pradesh. The hill station of Dalhousie lies in C. ter., which contains magnificent forests.

Chambal, riv. in central India, trib. of the Jumna R. (q.v.). It rises in the Vindhya Range (2019 ft) and flows 650 m. in a N.E. direction to its junction with the Jumna, 90 m. S.E. of Agra.

Chamber Music, name for music suitable for performance at home, as distinct from church and theatre music, but now also applicable to concert music performed by small groups of solo instruments. It has been said that C. M. dates no further back than Haydn, but this is quite untrue, since the fantasies for consorts of viols of the age of Elizabeth I, and the 17th-cent. It. *sonata da camera*, usually for 2 violins, bass viol (or cello), and continuo (q.v.), are earlier examples of what is domestic music of the same kind. What Haydn did develop, though not originate, was the string quartet, which is, so to speak, the staple form of C. M.; it was in his hands that it became allied to sonata (q.v.) form, having been at first, like the symphony, hardly distinguishable from the It. operatic overture, which was in fact usually called *sinfonia*. Mozart and Beethoven cultivated the quartet at its finest; what is more, the former showed that C. M. in sonata form could be equally perfect in various other instrumental combinations, with or without piano parts, and the latter, in his last quartets, that this classical form was capable of being departed from or transcended. The purest C. M. in the classical manner in the early 19th cent. was written by Schubert and in its late years by Dvořák, for although the latter was surpassed by Brahms, the Czech composer understood the ideal chamber style better than the Ger. master. Brahms's C. M. is more considerable, but he transfers to its medium a good deal that is actually orchestral in conception, though still suitable because, like most of Brahms's music even in other domains, it is domestic in feeling. Schumann's C. M. is purer, but less important; on the other hand the C. M. medium was stretched either in the direction of ampler sound or in that of

programme music (q.v.) by Smetana in Bohemia, Tchaikovsky in Russia, Grieg in Norway, and Franck in France. It was in France, however, that much was done by the beginning of the 20th cent. to purge C. M. of such elements, especially by Fauré, Debussy, and Ravel, but also by disciples of Franck, such as d'Indy and Chausson. In Russia a true chamber style was cultivated by Glazunov and, more interestingly, Taneyev; in Germany Max Reger did a vast amount of work with a similar aim, but overloaded its essentially classical structures with excessive technical difficulties and tortuous chromatic modulations. It was Hindemith who restored Ger. C. M. to its proper functions by simplifying his texture, though not his idiom, sometimes to the point of calling and actually making his chamber works 'utility music,' designed for moderately skilled players. In modern England C. M., very little cultivated in the home, is written mainly for concert performance and therefore often difficult to play; but it has been finely cultivated by many composers, including Stanford, Frank Bridge, Arnold Bax, John Ireland, Arthur Bliss, Edmund Rubbra, Gerald Finzi, Michael Tippett, Elizabeth Maconchy, and Benjamin Frankel, to name only some who have more or less specialised in C. M., though Elgar, Holst, Vaughan Williams, and others have contributed notably to the species. In Hungary Bartók has achieved what is perhaps the most important development of the string quartet since Beethoven; in Italy Pizzetti has revived true C. M. nobly; in Czechoslovakia the most original contribution has been made by Janáček. Amer. composers are faced with much the same decline in domestic music-making as those of Great Britain, but many have contributed assiduously to the concert repertory.

It remains to be said that although C. M. is mainly instrumental, it does not exclude the human voice. In the 17th and 18th cents. chamber cantatas and duets were fashionable; in modern times settings of poetry often provide single vocal parts consorting with various instrumental combinations.

Chamber of Commerce, an organisation formed to protect the interests of private enterprise in industry and commerce within a particular tn or area. In some countries C.s of C. are gov. controlled and membership is compulsory, whereas in others—such as the U.K.—C.s of C. are independent bodies, relying for their revenue on the voluntary subscriptions paid by their members. Such basic differences make generalisations impossible, but it is true to say that C.s of C. are universally respected, and their advice is frequently sought by govts. The first C. of C. was formed in France, at Marseilles, in 1599, and the first chamber to be formed in the U.K. was in Glasgow in 1783, when it was incorporated under royal charter by George III. To-day nearly every manufacturing centre in the U.K. has its local C. of C., the largest of these being the London C. of C. with a

direct membership of 12,500, and a further 50,000 represented on its council through 46 affiliated associations. The London chamber is the largest in the world.

Membership of a U.K. C. of C. is composed mainly of manufacturers and merchants. It should be remembered, however, that in the U.K. the title 'Chamber of Commerce' is not protected in law, and there are a number of bodies using the title which could more appropriately be styled 'Chambers of Trade,' as their membership is predominantly retail. At a national level the views of C.s of C. in the U.K. are co-ordinated by the Association of British Chambers of Commerce (A.B.C.C.), to which some 98 U.K. chambers and 16 Brit. chambers in foreign countries are affiliated, the majority being incorporated by the Board of Trade under the Companies' Act (to-day only incorporated chambers are accepted for affiliation). Her Majesty's Gov. frequently seeks the views of C.s of C., both from the association on national policy matters and from its constituents on subjects they are particularly qualified to handle. An example of the confidence placed in C.s of C. affiliated to the A.B.C.C. is the fact that only these chambers, together with the London and regional offices of the Federation of Brit. Industries (q.v.), are authorised by the Board of Trade to issue certificates of origin and to certify commercial invoices. So extensive are the activities of U.K. chambers, both locally and nationally, that it is impracticable to give a comprehensive list. Reference should, however, be made to some particular aspects of their work; e.g. some large chambers—London and Manchester—have estab. courts of arbitration; in areas where a particular industry has developed, specialised services are offered, such as the facilities of the textile testing laboratory estab. by the Manchester chamber; the A.B.C.C. is one of the sponsoring bodies for the National Certificate in Commerce; the commercial examinations set by the London chamber are widely recognised and internationally known and accepted; the Birmingham chamber organises the Brit. Industries Fair which is staged in extensive fair space and buildings at Castle Bromwich.

The more important C.s of C. affiliated to the A.B.C.C. assist their members in the following matters: agencies, contract terms, export and import problems, parl. reports, local affairs, market reports, purchase tax, rating policy, taxation matters, tn and country planning, trade inquiries, trade marks and names, and trans. These are but some of the varied services available on request from members.

The object of Brit. C.s of C. in foreign countries is to promote Brit. trade in the country in which they are situated. To qualify for membership of the A.B.C.C. such chambers must confine the privileges of full membership to Brit. subjects, and the officers, members of the council, and the secretary must be British. The

first of these chambers was formed in Paris in 1873. Correspondingly, there are a number of foreign C.s of C. in the U.K. The views of C.s of C. within the Commonwealth are co-ordinated by the Federation of Commonwealth and Brit. Empire C.s of C., which was formed in 1886 and the secretariat for which is in the London C. of C. This body holds triennial congresses, at which questions of general interest to traders in all parts of the Commonwealth are discussed and examined, and policies suggested for the guidance of the govts. of the Commonwealth and dominions. At an international level the International C. of C. (see below) serves a similar purpose on a worldwide scale.

Chamber of Commerce, International, founded in 1920 to promote international trade (H.Q. in Paris). Its objects are to express, and to represent to govts., the considered judgment of international business on current problems of international trade, to improve trading conditions, and to foster private enterprise. It has the highest grade of consultative status with the U.N.O. Membership covers 57 countries of which 36 maintain national committees. Executive authority is vested in its elected council which meets 3 times a year. The International C. of C. Congress meets every 2 years. The address of the Brit. national committee is 15 Kingsway, W.C.2.

Chamber of Shipping of the U.K. includes most of the ship-owners' associations of the U.K. It communicates with the chief gov. depts on all matters affecting the interests of Brit. merchant shipping. In 1929 the chamber passed resolutions in favour of an international load-line agreement, and a uniform standard for safety of life at sea. Its affairs are managed by an executive council to which each affiliated association elects 1 or more members. Its offices are at 3 Bury Street, London, E.C.3. See **LOAD LINE** and **SHIPPING**.

Chamberlain, (Arthur) Neville (1869-1940), statesman, b. Birmingham, younger son of Joseph C., by his second wife, Florence Kenrick. He was educ. at Rugby and at Mason College, Birmingham (later known as Birmingham Univ.). He managed an estate in the Bahamas, 1890-7; returned to be a manufacturer in Birmingham; entered Birmingham City Council, 1911, and became chairman of the town planning committee and an alderman, 1914. During the First World War he was member of the Central Control Board (Liquor Traffic), 1915 and director-general of national service, 1916-1917. C. was lord mayor of Birmingham, 1915-16, and took a leading part in the estab. of the municipal bank, which began as a war-time expedient. In Dec. 1918 he was elected Conservative M.P. for the Ladywood div. of Birmingham; was made a privy councillor and postmaster-general in the Bonar Law ministry, in 1922; paymaster-general, 1923. When Baldwin replaced Bonar Law as Prime Minister, C. entered the Cabinet as minister of health. Only a

few months later he became chancellor of the exchequer. This series of meteoric promotions, remarkable in the case of a man who had not entered public life till he was past 40, was in a measure justified by the general recognition of his notable gifts for parl. debate. In 1924, when the Conservatives returned to power, C. was asked to resume the chancellorship of the exchequer, but he preferred to be minister of health and he made that ministry a leading dept of state. He became chancellor of the exchequer again in the National Gov., 1931, in succession to Snowden, and his first move was to carry



Elliott & Fry

NEVILLE CHAMBERLAIN

protection. In all C. introduced 6 budgets, and his policy was to refuse large state expenditure on public works and to restore confidence by economy, by raising wholesale prices, and by fostering easy credit and low rates of interest. He differed from the old *laissez-faire* school in that he desired large state expenditure on social reform, but only if private enterprise created the requisite wealth. His hope for a great programme of social reform were now, however, dashed by the menace to international security and the need to think of rearmament. It was on his advice that the gov. capitulated to Mussolini on the question of sanctions over the war with Abyssinia. In Feb. 1937 he announced the gov.'s decision to spend £1,500,000 on rearmament. Later that year he succeeded Baldwin as Premier. Early in 1938 he came into conflict with his foreign secretary, Eden, over his decision to negotiate an agreement with Italy and Eden resigned.

This was in fact the real beginning of the 'appeasement policy' with which the memory of C. must ever be associated. Himself comparatively a novice in foreign affairs, he had an instinctive distrust of the Foreign Office experts and was largely his own foreign secretary. He insisted on a rigidly non-interventionist attitude towards Spain; and early in 1939 visited Mussolini. When, in 1938, war with Germany seemed inevitable over the Sudeten issue, C. then took the unprecedented step of going by plane to Berchtesgaden to see Hitler. As he was now 69 and had never flown before, the world saw an element of the heroic in this personal dash for peace. C. acceded to Hitler's damaging demands and carried both the Brit. and Fr. Cabinets with him. At a second meeting with Hitler at Godesberg, Hitler naturally raised his price and even C. shrank from compliance. War seemed imminent but, on the intervention of Mussolini, C. and Hitler were once again brought together—this time at the notorious Munich 4-power meeting (see MUNICH PACT) which in effect throw the Czechs overboard. C. deluded himself by bringing back a worthless signature to a treaty of permanent friendship between Germany and Britain. He announced that he had 'brought back peace with honour' and he believed that it was 'peace for our time'; and he compared his home-coming to that of Beaconsfield from Berlin in 1878. He was acclaimed everywhere, and though disillusionment soon followed with the increasingly bellicose tone of Ger. political utterances, C. continued to point to his various international agreements as vindications of his policy of appeasement. In Feb. 1939 he announced Britain's recognition of the Franco regime in Spain, and repeated his conviction, with obvious sincerity, that Germany had no aggressive intention. On 10 Mar. he gave out a statement that the international outlook was fair; but 5 days later Hitler invaded Czechoslovakia. At this point C. seems to have realised at last that appeasement had failed. He rebuked Hitler for his perfidy, gave a guarantee to Poland and, still later, guarantees to Rumania and Greece. It is true to say that C.'s part in the Munich Pact gave Britain a year in which to make good her defences; but in fact his rearmament programme did not keep pace with that of Germany, and on 1 Sept. 1939 Germany's lead in air strength was much greater than at the time of Munich. It was only in May that C. at last consented to waive his prejudice against the formation of a Ministry of Supply. Himself a quick and business-like administrator, he neither filled ministerial posts with able ministers nor had the power to drive others. Britain declared war on Germany on 3 Sept., after Germany had invaded Poland; and C. announced the fact in a moving and historic broadcast. His gov. was not to survive much longer. The failure of the allied campaign in Norway infuriated the whole country, and in the debate in the Commons of 6-8 May his vote of

confidence was passed by only 281 to 200, a great many gov. supporters abstaining. C. then tried to meet the rising storm by reshuffling his Cabinet, but Labour refused to join any gov. under him and he resigned on 10 May, the day when the Germans invaded the low countries. As lord president of the council in the Churchill Gov. he wholeheartedly supported the new Prime Minister's resolve to continue the war come what might. At the end of July he underwent an operation, but hopes of recovery were not fulfilled. He d. 8 Nov. See D. Keith Shaw, *Prime Minister Neville Chamberlain*, 1939, and K. Felling, *The Life of Neville Chamberlain*, 1946.

Chamberlain, Basil Hall (1850-1935), scholar, b. Southsea, Hants. Held the chair of Japanese and philology at the Univ. of Tokyo. Among his pub. are *Essay in Aid of a Grammar and Dictionary of the Luchuan Language*, 1874, *The Classical Poetry of the Japanese*, 1880, *A Romanised Japanese Reader*, 1886, *A Simplified Grammar of the Japanese Language*, 1886, *The Language, Mythology, and Geographical Nomenclature of Japan viewed in the Light of Aino Studies*, 1887, *Ainos*, 1888, *A Handbook for Colloquial Japanese*, 1888 (revised ed., 1907), *Things Japanese*, 1890 (6th ed., 1938), *A Handbook for Travellers in Japan*, 1891 (5th ed., 1899), *A Practical Introduction to the Study of Japanese Writing*, 1899 (2nd ed., 1905), Murray's *Japan* (3rd and subsequent eds. in collaboration with W. B. Mason), *Japanese Poetry*, 1911, and *Uuit Siecles de Poésie française*, 1927.

Chamberlain, Houston Stewart (1855-1927), Anglo-Ger. author, b. Southsea, the son of an admiral, and educ. at Cheltenham. He later lectured on philosophy at Vienna Univ. The results of his study of modern thought and civilisation are embodied in his book *Die Grundlagen des neunzehnten Jahrhunderts*, 1899, trans. into English in 1910. In 1896 he pub. a biography of Wagner, whose daughter he married. He became a naturalised German, his admiration of the Ger. way of life being coupled with an intense hatred of anything English. During the First World War he wrote much anti-Brit. propaganda. C. was a strong anti-Semite and probably Hitler derived his Aryan theory and policy partly from C. See A. Rosenberg, *Houston Stewart Chamberlain als Begründer einer deutschen Zukunft*, 1927.

Chamberlain, John (1554-1628), Eng. letter-writer, b. London, and educ. at Trinity College, Cambridge. His own life was uneventful, but he was a friend of such people as Inigo Jones, Lancelot Andrewes, etc., and his nearly 500 extant letters (1597-1628) give a vivid picture of many aspects of Jacobean life. See W. Notestein, *Four Worthies*, 1956. His letters were ed. by N. McClure, 1939.

Chamberlain, Joseph (1836-1914), statesman, b. London, son of a rich Unitarian business man, and educ. at Canonbury and at the Univ. College school (London). On leaving school he spent

a short time in his father's office in tn, and then left for Birmingham, where he joined his cousin, Joseph Nettlefold, in the screw business. His keen business methods and his undoubted ability ensured the progress of the firm. As a result C. was able to retire from business at an early age, a very wealthy man, and take an active interest in public life. He was already recognised as one of the leaders of liberal ideas in Birmingham, and had been instrumental in establishing a Liberal Association in the tn. In 1870 he became a member of the Birmingham school board, and 3 years later the chairman. His politics at this time were usually given the name of republican, not because they actually advocated the principles of republicanism, but because they were so advanced and so radical that they easily outdistanced even the most liberal ideas of the formal Liberal party. In 1873 he became mayor of Birmingham, an office he occupied for the succeeding 3 years, and during his period of office many reforms and much public rebuilding were carried out. C. soon gained a national reputation. In 1878 C. became one of the M.P.s for Birmingham, his colleague being John Bright (q.v.).

He rapidly advanced towards the front ranks of the Liberal party. He showed his organising ability by the manner in which he organised the Liberal Association throughout the country, an organisation for which both he and the Liberal party were recompensed in the general election of 1880, when the Liberals were returned with a clear majority over both the Conservatives and the Nationalists. In the Liberal Gov. of 1880, C. was given the position of the president of the Board of Trade, with Cabinet rank, and Sir Charles Dilke, another leader of the radical section, became under-secretary for foreign affairs. In 1885 he put forward what was called the 'unauthorised programme,' that is, a programme which went far beyond the conception of the Liberal party. He had up to this time supported the Liberal party on questions of foreign policy, and more especially Irish policy. He advocated also free education and small holdings, the famous phrase 'three acres and a cow' exemplifying the latter policy. In 1885 Gladstone's ministry was defeated. At the elections which followed the number of Liberal members was decreased, and it became necessary to depend on the Irish vote for a majority. C. was returned for W. Birmingham, and in Jan. 1886 Salisbury's gov. was defeated. Already it was known that Gladstone was going to introduce a Home Rule Bill, but C. accepted office as president of the Local Gov. Board. In Mar. he resigned, giving as his reason that he was unable to accept the measure which Gladstone had laid before the Cabinet, that he still supported a large extension of local gov. for Ireland, but could not go to the lengths proposed, and in the end C. and his followers voted against Gladstone's Bill. The feeling of the Gladstonian Liberals, not unnaturally, was deep and bitter against C. The

Liberal-Unionists led by C. rapidly became more and more separated from the Gladstonian Liberals, and they adopted a definite policy for themselves. They decided that it was necessary under every consideration to keep Gladstone out of office, and they supported the Tories with that end in view. They did not, however, yet take office with the Tories, and their influence was rather widening in Tory policy. The Tory Gov. passed measures which up to this time had been regarded solely as part of the Liberal programme, and many of them were more progressive than similar measures previously adopted by the Liberals. In the general election of 1892 C. was again returned for his old constituency, but the Liberal-Unionists and Tories were in a minority and Gladstone became Prime Minister. In 1893 C. took the most prominent part in opposing the Home Rule measure introduced by Gladstone; a measure which passed the House of Commons but was rejected by the Lords. In 1895 the Rosebery gov. was defeated, and the gov. which was formed by Salisbury included a number of Liberal-Unionists. This was the first great definite step towards the union of the parties. C. became colonial secretary.

The period 1895-1900 was one of great difficulty, especially in the matter of colonial affairs, and more especially in S. Africa. War broke out in 1899, but in 1900 C. received vindication of his actions as colonial secretary in the result of the election which followed. During this period of office he had also passed the Australian Commonwealth Act (1900). During the years of office C. had advocated the policy called imperialism. He had never subscribed to the narrow limits of the Gladstonian foreign policy, and his tenure of office as minister for the colonies had taken his ideals from the purely national point of view and widened them to the imperial point of view. During the war he was the hero of his party, and by his firm policy and his unswerving support of the war did much to enhance his reputation.

In 1902 Arthur Balfour became Prime Minister, and C. continued to serve under him. The Boer War had convinced him that the economic links of the Brit. Empire must be strengthened, and in 1903 he stated his belief in an imperial preferential tariff. The Conservative party was bitterly divided on the subject, and C., pleading for a free hand, resigned. Ritchie and Hamilton, the stauncher free traders, also resigned at the same time. C. resigned merely to become the pioneer of the movement which he advocated, and not from any sense of hostility towards his 'friend and leader' Balfour. Balfour's attitude on the question was more or less philosophic, and he was claimed by both sections of his party. He, however, made it clear that he was in favour of a measure of tariff reform for purely retaliatory purposes. C. spent the years 1903-6 in travelling throughout the country advocating his system of tariff reform. The withdrawal of C. from the

Cabinet, and the advocacy of these new measures, contributed to the downfall of the gov., which resigned in Dec. 1905. The election which followed was to a very great extent the result of the differences in the party. C. insisted on the adoption of his principles, and the Unionist party was overwhelmed at the elections. Balfour, after the elections, pledged himself to tariff reform, which after that became the prin. plank of the Unionist platform. But C.'s health had broken down, and after 1906, though retaining his parl. seat, he took no further part in politics. See J. L. Garvin, *The Life of Joseph Chamberlain*, 1932.

Chamberlain, Sir (Joseph) Austen (1863-1937), statesman, eldest son of Joseph C., educ. at Rugby and Cambridge. In 1892 he entered Parliament as Liberal-Unionist member for E. Worcs, for which constituency he sat till 1914. From that year he represented Birmingham W., his father's former constituency. During Lord Salisbury's third administration (1895-1900), C. was civil lord of the Admiralty, being promoted as financial secretary to the Treasury on the formation of Salisbury's fourth Gov. (1900-2). As financial secretary he represented the postmaster-general, Lord Londonderry, in the House of Commons. He became postmaster-general in Balfour's first Gov., July 1902. C. was appointed chancellor of the exchequer on the reconstruction of Balfour's Cabinet, 1903-6. In 1913 he was chairman of the royal commission on Indian finance and currency. In the Coalition Gov. formed during the First World War he was secretary of state for India, 1915-17—resigning because the dept over which he presided was culpable in regard to the Mesopotamian campaign. He became a member of the War Cabinet, without office, in 1918. He was chancellor of the exchequer, 1919-21; lord privy seal and leader of the House of Commons, 1921-2. Later, in the Conservative Gov., he was secretary of state for foreign affairs, 1924-1929; and signed the Locarno Treaty, 1925 (he was knighted for his services in this connection), and the Kellogg Pact, 1928. He was lord rector of Glasgow Univ., 1925-8. He received the Nobel peace prize, 1926. C. wrote his autobiography in 1935. See Sir C. Petrie, *The Life and Letters of Sir Austen Chamberlain*, 1939.

Chamberlain, Sir Neville Bowles (1820-1902), field marshal, b. Rio de Janeiro, Brazil. He entered the Indian Army in 1837 and took part in the Afghan war (1839-42) at Ghazni, Kandahar, and Kabul, and was wounded on 6 occasions. He fought at Maharajpur in the Gwalior campaign of 1843 and in the Punjab campaign of 1848, after which he was made commandant of the Punjab military police. In the Indian Mutiny (1857) he distinguished himself at Delhi, where he was severely wounded. He was in command of the Umbeylea campaign (1863), and from 1876 to 1881 was commander-in-chief of the Madras Army. He retired in 1886, and was made a field

marshal in 1900. See life by G. W. Forrest, 1909.

Chamberlain, officer attached to the court of a monarch, appointed by a king, nobleman, or corporation to perform domestic and ceremonial duties. In Great Britain this office dates from very early times. The C. was one of the chief officers of state from the 13th cent.; 1406, Parliament declared that he must be a member of the Council (*see* CABINET) *ex officio*. Hence he had a large share in the responsibilities of gov., and though this is no longer the case he remains an officer of very high standing in the royal household. The Lord C. has control over all officers, servants (except those of the bed-chamber), physicians, musicians, comedians, and tradesmen connected with the royal household. In 1782 he became provider of state robes for the royal family and household and officers of state. Cards of admission to royal functions (levees, drawing-rooms, balls) must be obtained from him. Theatres in tns containing a royal palace have to be licensed by the Lord C.; no new play can be performed without his sanction (*see* CENSORSHIP OF THE DRAMA). A vice-C. as deputy and assistant has existed from the time of Richard II. Other state officials are the Lord Great C. and City C. (of various corporations).

Chamberlain, Lord Great, hereditary office, historically descended from the ancient chamberlain of the Exchequer of the Norman period. The office was formerly of the highest dignity, and was held in grand serjeanty. The L. G. C. is now the sixth great officer of state, and the duties of the office are mainly concerned with coronation ceremonies. To the office also appertain the care of the queen's palace at Westminster, authority over the buildings of the 2 Houses of Parliament during recesses, and the duty of attending on peers at their creation, and bishops when they perform their homage. The office, which became hereditary on the grant by Henry I to the family of De Vere, Earls of Oxford, has been the subject of 2 legal contests within the last 150 years. Towards the end of the 19th cent. it was still held conjointly by the families of Cholmondeley and Willoughby d'Eresby, in right of their mothers, who were sisters and co-heirs of the 4th Duke of Ancaster, but later it was in the joint tenure of the Marquess of Cholmondeley, the Earl of Ancaster, and the Marquess of Lincs. The present holder of the office is the 5th Marquess of Cholmondeley.

Chamberlens, name of family of man-midwives and physicians of Huguenot descent:

William Chamberlen (c. 1540-96) fled from France to England with his family in 1569.

Peter Chamberlen (I) (1560-1631), eldest son of Wm, was physician to James I and his wife. The obstetric forceps used by the Chamberlens and kept a closely guarded secret by them, were probably invented by Peter I.

Peter Chamberlen (II) (1572-1626),

fifth and last child of Wm, fell foul of the Royal College of Physicians for practising medicine without a licence and for not confining himself to midwifery.

Peter Chamberlen (III) (1601-83), son of Peter II, went to Cambridge and Padua, at which latter he was M.D., 1619. He succeeded his uncle, Peter I, as court physician and delivered Charles II in 1630. He attempted to organise the female midwives into a company with himself as their president; for this he was reprimanded by the Royal College (he was a fellow of the college in 1628, but was dismissed from his fellowship in 1649). A very successful obstetrician, he returned to his court appointment on the accession of Charles II.

Hugh Chamberlen (fl. 1665-1700), eldest son of Peter III, succeeded his father at court in 1673. He again used the 'secret instrument' with great success, and attempted to sell it to Francois Mauriceau, the Fr. obstetrician, for 10,000 livres. He attended Mary, Queen to James II, at the birth of the Old Pretender, and Princess (later Queen) Anne. He advocated a health insurance scheme which was not adopted, and a land bank which failed and caused him to retire hastily to Holland.

The secret instrument was used by the Chamberlens for many years, enabling them to deliver more women more effectively than anyone before them. When Peter III retired he went to live at Woodham Mortimer Hall, near Maldon, Essex. After his death his widow hid a box beneath a trap-door in the attic, and it remained there until 1813, when it was discovered and found to contain the secret—3 sets of obstetric forceps—with other midwifery instruments. These are now in the possession of the Royal Society of Medicine. *See* W. Radcliffe, *The Secret Instrument*, 1947.

Chamberlin, Thomas Chrowder (1843-1928), geologist, b. Mattoon, Illinois. In 1869 he was appointed prof. of natural science at the State Normal School of Whitewater, Wisconsin, and was appointed prof. and head of the dept of geology and director of the Walker Museum of the univ. of Chicago. In 1894 C. accompanied the Peary Arctic Relief Expedition as geologist. He was also from 1902 to 1909 investigator of fundamental geological problems in the Carnegie Institution.

His theories on the glacial deposits of the N. states, together with his work on the planetesimal hypothesis with Moulton, won for C. a worldwide reputation. For nearly 40 years he edited the *Journal of Geology*, and his pubs. include *The Geology of Wisconsin*, 1877-1883, *Contribution to the Theory of Glacial Motion*, 1904, *General Treatise on Geology* (with R. D. Salisbury), 1907-9, *The Origin of the Earth*, 1916, and *The Two Solar Families: the Sun's Children*, 1928.

Chambers, Charles Haddon (1860-1921), Australian playwright, b. Stanmore, Sydney. His father was in the Civil Service, which he himself entered at 15; but after 2 years he gave it up and

became a stockrider. At the age of 22 he went to London, and in 1888 won success as a playwright with his comedy *Captain Swift*. Other plays are *The Idler*, 1891, *John-a-Dreams*, 1894, *The Tyranny of Tears*, 1899, his best work, and *Passers-By*, 1911.

Chambers, or Chalmers, David, Lord Ormond (c. 1530-92), judge and historian, educ. at Aberdeen, then studied theology and law in France and Italy. Parson of Suddy, chancellor of Ross, lord of session (1605). A partisan of Mary Queen of Scots, said to have been privy to Darnley's murder, 1567. Attainted by Parliament after the battle of Langside, he fled to Spain and France. Pub. *Abregé des histoires*, reprinted with additions, 1579 (a chronological summary of European hist.). C. returned to Scotland, becoming again lord of session, 1586.

Chambers, Sir Edmund Kirchover (1866-1954), scholar, b. Berks, son of Rev. Wm C., fellow of Worcester College, Oxford. He was educ. at Marlborough and Oxford. His great works are *The Medieval Stage*, 1903, and *The Elizabethan Stage*, 1923. In these he shows the connection between the political and social hist. of England and the growth and flowering of the drama. The latter book unfolds in minute detail the story of each stage company, and sums up all the knowledge in existence on the subject. Other publications include *Tudor Revels*, 1906; *Shakespeare: a Survey*, 1925; *William Shakespeare*, 1930, which assembles all the known facts of Shakespeare's life; *Arthur of Britain*, 1928, a brief but penetrating discussion of Neunnius's sources. *Oxford Book of Sixteenth Century Verse*, 1932; *S. T. Coleridge*, 1938; and *A Sheaf of Studies*, 1942. He was knighted in 1925.

Chambers, Ephraim (1680-1740), encyclopaedist, b. Kendal. As a young man he was apprenticed to a map-maker in London. In 1728 he pub. by subscription his *Cyclopaedia, or an Universal Dictionary of Arts and Sciences* in competition with Harris's *Lexicon Technicum*, 1704. C.'s work reached its fourth ed. a year after his death, and gave rise to the *Encyclopédie* of Diderot and d'Alembert.

Chambers, George (c. 1803-40), marine painter, b. Whitby, Yorks. He was the son of a fisherman, and went to sea as a boy; but his sketches of shipping scenes found a market in Whitby, and he set out for London where he became a scene painter at the Pavilion Theatre. He also worked on the panorama of London at the Colosseum. His work received the attention of Lord Mark Kerr, through whose patronage C. received the appointment of marine painter to William IV and Queen Adelaide. He was a member of the Society of Painters in Water Colours, and exhibited from 1827 to 1840. Two of his pictures of naval battles are at Greenwich, viz. 'The Capture of Porto Bello' and 'The Bombardment of Algiers in 1836.'

Chambers, Robert (1802-71), author and publisher, b. Peebles and educ. at the local school. In 1818 he started business

as a bookstall keeper in Leith Walk, Edinburgh. With his brother Wm (q.v.) he founded the publishing firm of W. & R. Chambers. In 1825 he pub. *Traditions of Edinburgh*, which won him the friendship of Scott and led to further writings of the same description, *Notes of the Most Remarkable Fires in Edinburgh from 1385 to 1824*, 1824, and *Walks in Edinburgh*, 1825. Robert was at first only a contributor to the *Journal* started by his brother in 1832. Later he became joint editor, and his essays and wisdom in selection of such materials in literature, hist., art, and science as would best suit the popular taste were large factors in the success of the paper. He wrote the *Life and Works of Robert Burns*, 1851, for which he gathered many hitherto unpublished details from the poet's sister, Mrs Begg. Robert C. was an ardent scientist, and visited Scandinavia and Canada for purposes of geological exploration, the results of which are contained in *Tracings of the North of Europe*, 1850, and *Tracings in Iceland and the Faröe Islands*, 1856. In 1844 he pub. anonymously, to avoid bringing an accusation of heterodoxy upon his firm, *Vestiges of the Natural History of Creation*, which anticipated the theories of Darwin's *Origin of Species*. The authorship was acknowledged in Alexander Ireland's preface to the 12th ed., 1884. In 1869 the univ. of St Andrews conferred upon him the degree of Doctor of Laws, and he was elected a member of the Athenaeum Club in London. See W. Chambers, *Memoir of Robert Chambers with Autobiographic Reminiscences of William Chambers*, 1872, 1881, and *Story of a Long and Busy Life*, 1884.

Chambers, Robert William (1865-1933), Amer. novelist, b. Brooklyn, New York. Educ. at Brooklyn Polytechnic, he went on to study art in Paris, and exhibited at the Salon. His first book, *In the Quarter*, was pub. in 1891, and after that he became a prolific writer, publishing some 70 novels, mainly historical romances.

Chambers, Sir William, R.A. (1723-96), architect, b. Stockholm, son of a Scottish merchant. Travelled as a supercargo to China when a youth, made drawings there of buildings, costumes, etc., and decided to become an architect. Then studied architecture in Italy and Paris. Returning to England, 1755, he taught drawing to the Prince of Wales (afterwards George III), and pub. *Designs for Chinese Buildings*, 1757. He was employed to lay out Kew Gardens, and built the pagoda and orangery there. His *Treatise on Civil Architecture*, 1759, became a standard work. In 1761 he was appointed—jointly with R. Adam (q.v.)—one of the 2 official 'Architects of the Works'; and in 1782 became surveyor-general. His masterpiece is Somerset House, 1776-86, much altered in appearance by the subsequent construction of the Embankment and Waterloo Bridge. The small Casino at Marino near Dublin is perhaps the best of a very long list of public and domestic buildings, which included additions to Trinity College, Dublin. He was a co-founder of the Royal

Academy of Arts, and its first treasurer, 1768.

Chambers, William (1800-83), publisher, b. Peebles. In 1813, owing to family misfortunes, he was apprenticed to a bookseller in Edinburgh. Five years later he started business for himself, afterwards adding printing to the bookselling, and was soon joined by his brother Robert. In 1825-30 he wrote the *Book of Scotland*, and collaborated with Robert in a *Gazetteer of Scotland*. In 1832 he issued the first number of *Chambers's Edinburgh Journal*, the pioneer of the cheap popular periodical. This led to the founding of the firm of W. & R. Chambers, and the issue of *Chambers's Encyclopaedia* (10 vols.), first pub. in 1859-68. See also CHAMBERS, ROBERT.

Chambersburg, bor., cap. of Franklin co., Pennsylvania, U.S.A., 50 m. SW. of Harrisburg. The tn has many fine buildings, among which is the Wilson College for girls. The trade of the tn is extensive, and among its chief manufacturing industries are metal and paper products, food, clothing, machinery, and flour; there is also fruit growing. In 1864 a portion of the tn was destroyed by the Confederates. Pop. 17,212.

Chambertin, see BURGUNDY.

Chambéry, Fr. tn, cap. of the dept of Savoie, in a gorge linking the R. Isère to Lake Bourget. It is the seat of an archbishop, and was the anct cap. of the Duchy of Savoy (q.v.). Part of the 15th-cent. château of the dukes of Savoy remains, now incorporated into a modern building. C. is a tourist centre, has good wines (including vermouth), and a silk industry and tanneries. It also manufs. confectionery. J. and X. de Maistre (q.v.) were b. here. Pop. 30,000.

Chambon-Feugerolles, Le, Fr. tn in the dept of Loire, on the Ondaine. It has steel manufs. Pop. 15,700.

Chambord, Henri Charles Dieudonné, Comte de and Duc de Bordeaux (1820-83), posthumous son of the Duc de Berry and grandson of Charles X of France, b. Paris. Charles X abdicated in favour of his grandson (known to his supporters as Henri V of France) in July 1830, but the movement in favour of Louis Philippe forced Charles and his grandson to flee to England. C.'s character was weak and indecisive, and his readiness to comply with the plans of the vacillating nobles who supported his cause dissipated his chances of attaining to the throne, both in 1848 and in 1870. He d. at Frohsdorf, Austria, without an heir, the nearest claimant being the Comte de Paris.

Chambord, famous château of the Renaissance period, situated in the dept of Loir-et-Cher, France, 12 m. E. of Blois (q.v.). The building of the castle was commenced by Francis I in 1519, and was completed by his successors of the Houses of Valois and Bourbon. It is a huge pile, capped by many turrets and gables, and stands in a walled park of 13,000 ac. It has been the residence of the Fr. kings down to Louis XV, and of Marshal Saxe, Diane de Poitiers, Stanislaus Leszczyński, King of Poland, and Marshal Berthier,

who had it conferred upon him by Napoleon in 1809 (q.v.). After the death of Berthier it passed into the hands of the comte de Chambord, who left it to the house of Bourbon-Parma. Molière gave his first performance of the *Bourgeois Gentilhomme* in the castle in 1670. See A. Arnauld, *La Question de Chambord*, 1887, and H. Debraye, *Touraine and its Châteaux*, 1928.

Chambre Ardente (Fr. 'flaming chamber'), court organised c. 1535 by Francis I of France for the suppression of Protestant heresy. The courts were draped with black and lit, even in the day-time, by torches. The C. A. was abolished in 1682.

Chambre Inouvable (Fr. 'the matchless chamber'), name popularly given to the Chamber of Deputies which was first convened in July 1815, after the second recall of Louis XVIII. This Parliament roused indignation and alarm throughout France for its thorough-going royalist policy. The term has since been ironically applied to any ultra-monarchical assembly.

Chamdo, or **Ch'angtu**: 1. Name of a Tibetan Autonomous Region, W. of Szechwan, China. It covers an area of 78,000 sq. m. with 23 cos. under its administration. Pop. 200,000, mostly Tibetans. The Szechwan-Tibet motor-way traverses this region.

2. Chief tn of the C. Autonomous Region, on long. 97° E., lat. 31° N. It has sev. monasteries frequented by Lamaist pilgrims. With the motor-way completed in 1954 it has become a trading centre between Lhasa and Chengtu. Pop. (estimated) 15,000.



CHAMELEON

Chameleon, name of a large and distinct order of lizards in the family Chamaeleontidae which inhabit S. Spain, Asia, and Africa, but especially Madagascar. Many of their characteristics are very peculiar, e.g. the long, prehensile tail used in steadying the animal by being coiled round a branch; the long, sticky, club-shaped tongue which can project about

the length of its body; the eyes covered with a thick granular lid capable of moving independently and squinting; the 5 digits in bundles of twos and threes; the triangular head, flattened body with a toothed crest; and the habit of changing colour which can be performed at will. They are all insectivorous, are rather quarrelsome and inactive, difficult to keep in captivity, and when angry they will distend their capacious lungs and puff out their bodies to a great extent. At night they sleep on a twig, and in winter hibernate after taking in large supplies of food and water. Nearly all are oviparous, and the female lays her 30 to 40 eggs in a hole in the ground. The commonest species is *C. chamaeleon*, which never exceeds 1 ft in length, and *C. parsoni* is the largest species, sometimes measuring 2 ft from head to tail.

Chamfort, Louis Sébastien Roch (de) (1741-94). Fr. author and moralist, b. Clermont in Auvergne. His comedies, ballets, and critical writings, as well as his brilliant conversation, attracted a wide circle of admirers of every class. Louis XVI and Marie Antoinette favoured his literary efforts, but he was keenly opposed to the Royalist party during the revolutionary agitation. He became suspect, however, and to escape he was obliged to commit suicide. His works, mainly of apophthegms and anecdotal, were edited by Anguis and pub. in 5 vols., 1824-5. A selection of his works, called *The Cynic's Breviary*, is trans. by Hutchinson. See J. Teppe, *Chamfort: sa vie, son œuvre, sa pensée*, 1950.

Chamidae, family of molluscs nearly related to the cockles, belongs to the order Eulamellibranchiata. The members of the family are confined to the warmer seas, and fossils are abundant from the Jurassic. Two of the chief genera are *Chama* and *Diceras*.

Chamier, Frederick (1796-1870), naval historian and novelist, entered the navy at the age of 13, and served in the Walcheren expedition, and on the Mediterranean and W. Indian stations. He devoted his leisure to authorship. His most valuable work was a continuation of W. James's *Naval History of Great Britain*, 1837.

Chaminade, Cécile (1857-1944), Fr. musical composer, b. Paris. She began to compose at the age of 8, and her works became well known in France and England, where she toured widely. Works: *Les Amazones* (dramatic symphony); *Cultirhoé* (symphonic ballet); Trios for piano, violin, and cello; sev. vols. of songs and numerous piano pieces. Her style is light but melodious and elegant.

Chamisso, Adalbert von (Louis Charles Adelaide de Chamisso de Boncourt) (1781-1838), Ger. poet and naturalist. He was b. at the château of Boncourt in Champagne, but spent his childhood in Prussia, where his family took refuge during the Fr. Revolution. In 1798 he entered the Prussian Army, but in 1806, when war broke out, his patriotism led him to return to his native country. In

Paris he became the friend of Mme de Staël at Coppet, where he met Schlegel. At this time he began the study of botany, which he afterwards continued at Berlin, being appointed curator of the botanic gardens in 1819. He edited the *Musenalmannach* (1804-6), and became a member of the Berlin Academy in 1835. C.'s fame rests on his romantic ballads, which are by turns fantastic and lurid. *Peter Schlemihls wundersame Geschichte*, 1814, a prose tale, already known to folklore, of the man who sold his shadow to the devil, has been trans. into almost every European tongue. C. also made many verse trans. from poems in other languages, and wrote sev. works on natural hist. His collected works (6 vols.) were pub. by E. Hitzig, 1836-9. See K. Fulda, *Chamisso und seine Zeit*, 1881; E. du Bois-Reymond, *Chamisso als Naturforscher*, 1889; K. Leutznier, *Chamisso: a Sketch of his Life and Works*, 1893.

Chamois, goat-like antelope (*Rupicapra rupicapra*) inhabiting the mts of central and S. Europe (especially the Alps) and of W. Asia. Noted for great speed, agility, and delicate power of scent. The flesh is highly prized as venison, the skin furnishes true chamois-leather (sheepskin is often sold as such). The hunting of C. is a favourite but dangerous pastime in Switzerland and the Tyrol. In the Caucasus, Taurus, and Carpathians over 100 are often seen in a flock. The C. has short horns, and is grey-brown in colour. In the Pyrenées it is known as the izard.

Chamomile, see CAMOMILE.

Chamonix-Mont-Blanc, Chamonix, or Chamouni, Fr. vil. in the dept of Haute-Savoie, on the Arve, 40 m. SE. of Geneva. It is in a beautiful, narrow valley, N. of the Mont Blanc range. There are 7 glaciers in its vicinity. It is the usual approach to Mont Blanc (Dr Pacard (q.v.) ascended from here), and is extremely popular with mountaineers and tourists. The altitude is about 3400 ft. Pop. 5900. See BLANC, MONT.

Champa, name of a country which extended southwards from the R. Glang along the coastal region, now occupied by Annam, as far as the delta of the R. Mekong. The Cham people had racial and probably linguistic affinities with the is. peoples of SE. Asia, and their religion was a form of Hinduism. The hostility of the Vietnamese in the N. and the Khmers in the S. finally destroyed C. From the 11th cent. onwards the Vietnamese people pushed relentlessly southwards, annexing more and more of Cham ter. until, at the end of the 17th cent., C. was no more. Remains of Cham towers and other buildings still survive in Annam, and their sculpture reveals strong Indian and Khmer influences. Small pockets of Chams are still found to-day, chiefly in Cambodia and Cochín-China, where they live in houses raised on piles and continue to speak the Cham language.

Champac, or *Michelia champaca*, is an Asiatic evergreen tree, family Magnoliaceae, which is cultivated in China for its beautiful and scented flowers, handsome appearance, medicinal bark, and useful

timber. It is a sacred tree of the Buddhists and Brahmins.

Champagne, or Champaigne, Philippe de (1602-74), portrait painter of the Fr. school, b. Brussels. He first studied under Fouquieres at Antwerp, but in 1621 went to Paris, where he became the queen's painter. In this capacity he painted decorations in the Luxembourg for Marie de' Medici. He was appointed rector of the Académie de Peinture et de Sculpture, and received frequent commissions from Cardinal Richelieu. In his later years he became associated with the Port Royalists and the Jansenists. He inaugurated an official style of portraiture, typical works being his Cardinal Richelieu in the Louvre, and a triple portrait of Cardinal Richelieu in the National Gallery.

Champagne (Fr. 'flat country,' from Lat. *campus*, a field), dist. and former prov. of France, comprising the depts of Marne, Haute-Marne, Aube, and Ardennes, and part of Seine-et-Marne, Meuse, Aisne, and Yonne. The prov. was about 180 m. long by 150 m. broad. The land is fertile in the W. region, and its vineyards produce the famous champagne wines. The prov. was ruled at one time by the Franks, and later by native princes, the vassals of the Fr. kings. In 1284 it passed to the Fr. crown by the marriage of Philip IV to Joanna of Navarre. In the Middle Ages the fairs of C. were frequented by merchants from all over Europe. See F. Bourquelot, *Études sur les foires de Champagne*, 1865.

Champagne, Campaign in (First World War). The geographical position of C. renders it an obvious battlefield for an attack on France from the E. or NE. During the First World War it was the scene of great endeavours by both sides. Towards the end of Aug. 1914, von Moltke, chief of the Ger. General Staff, ordered Prince Rupprecht to penetrate the Fr. frontier at Nancy. The French here were under the command of de Castelnau, and after a battle lasting 6 days the Germans were repulsed with heavy loss. Further N., however, the Germans overran C. in their great sweep towards Paris, and Rheims, Châlons-sur-Marne, Épernay, and Château-Thierry all fell to them early in Sept. 1914. By 9 Sept. the Brit. Army, under Sir John French, was recrossing the R. Marne at Château-Thierry and taking the offensive against von Kluck, and with this movement the battle of the Marne commenced. By 14 Oct. the Germans had been forced back from just N. of Verdun—N. of Rheims—and N. of Soissons, and that part of C. S. of that line was not again invaded by the enemy during the war, except on the left, where it was again pierced by the Germans in July 1918. From the middle of Oct. to middle of Nov. 1914, the Germans kept a heavy pressure on the French in the Rheims-Soissons sector, and gained some ground about Moussy. At the beginning of the new year another action took place which resulted in the Germans gaining ground at Crouy. Taking advantage of the disorganisation of the Fr.

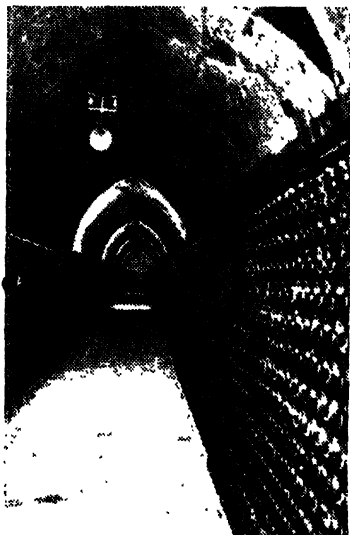
supplies occasioned by the sweeping away of all the bridges at Villeneuve and Soissons, the Germans again attacked, and maintained pressure for 2 days, and the French were forced to withdraw to the S. of the Aisne at Soissons. A few days later the French lost more positions on the Chemin-des-Dames (q.v.). After this a period of trench warfare set in, the lines occupied being chiefly dictated by the Ger. desire to maintain a strong line on the Verdun-Rheims sector. Joffre then decided upon a Fr. offensive in C., with a view to clearing the enemy N. of the Aisne. The advance began on 16 Feb., and after nearly a month's hard fighting little progress had been made, and at great sacrifice. Operations were practically suspended for the summer. With the object of breaking through the Ger. line E. of Rheims, an offensive was planned for the autumn. If this were successful it was hoped that it would so threaten the hostile flanks in this region as to compel their withdrawal. No attempt was made to keep the Fr. plan secret, and the Germans fully prepared to meet the offensive. The preliminary bombardment opened on 22 Sept. and was maintained for 3 days continuously. Operations went on fiercely until 29 Sept., but again little impression was made on the Ger. positions. Joffre resigned the post of commander-in-chief in Nov. 1916 and was succeeded by Gen. Nivelle, who had to meet difficulties within and without the army. A change of gov. had brought in ministers unfavourable to the proposed C. offensive. In the end, chiefly owing to support by the Brit. higher command, Nivelle was given a free hand. The offensive in C. commenced on 16 April, and important gains were made in ground and prisoners, etc. Pétain then succeeded Nivelle, with Foch as chief of the general staff. One of the chief Fr. successes in this region during 1917 was their victory over the Germans on the Chemin-des-Dames. During Oct. they had taken Fort Malmaison, and this placed them in a favourable position for attacking the Chemin-des-Dames, of which they made full use, the Germans being compelled to evacuate the position early in Nov. The area to the E. of Rheims was the main scene of the Ger. offensive in May 1918. Here they succeeded in making a great bulge in the Fr. line towards Paris, with Rheims and Soissons at the E. and W. ends, respectively, of the curve. The Chemin-des-Dames fell to the invader very early, and the Aisne was soon crossed, as was also the Vosie further S. Gradually Fr. resistance about Soissons was felt, then the Americans brought the Germans to a halt at Château-Thierry, and within a few days the Ger. offensive had shot its bolt. A further Ger. attack was attempted in the middle of July, but this melted away within 2 days. It was now the turn of the Allies to take the offensive, and the large salient created by the Germans in May was an obvious point of attack.

In this area Gen Mangin was in command of the Fr. Army. After a series of minor operations the general offensive

commenced on 18 July. An enormous number of tanks contributed largely to its success. In Aug. the offensive was resumed and maintained until the Germans were gradually forced back out of C. and eventually out of France.

Champagne Wines, grown in a region legally specified in 1911 within the ant. prov. of Champagne. They are pressed from the black and white *pinot* grape, the great Burgundy grape, the black grape giving depth and body, the white delicacy and perfume; white wines can be made from black grapes if the juice is removed before fermentation from the skins which contain the colouring matter. Grown in a barren, chalky soil such as the vine requires for the making of the finest wines, the grapes are picked over as soon as they are gathered and then pressed as quickly as possible, the juice being run off into a vat where fermentation takes place. The wine is then left to settle for 6 months or more. Vintage wines are supposed to be made entirely from the grapes gathered in some particularly good vintage, but nowadays they generally contain wines of earlier vintages, and very often a non-vintage wine, though cheaper, is quite as good as a vintage wine. Blending is an essential operation in the making of C., for every dist. has its peculiarity and it used to be said that the only C. which could stand on its own merits came from the vineyards of Ay (q.v.). So there is a blending of the wines of various vineyards and one of various years taken from the vast reserves of fine wine. Then, as the wine is bottled, a carefully calculated dose of sugar is added to provide for the secondary fermentation in the bottle which will give the wine its sparkle. The huge piles of bottles are stored in the famous chalk cellars of the region and the wine in them ferments, producing alcohol and carbonic acid gas from the added sugar and throwing a sediment. It is essential that C. should be golden star-bright, and the sediment has to be removed without releasing the gas from the bottle. In the course of a long operation, the sediment is gradually worked down the bottle until it rests on the cork. The bottles are placed in racks and very gradually tilted up by the *remueur*, a skilled craftsman who by a special turn of the wrist displaces the sediment until the bottles are upside down. Then the neck of the bottle is frozen hard and the cork removed with the sediment with a minimum waste of wine. C. is one of the hardestest of wines, almost proof against climate and ill usage, and a certain alcoholic degree is necessary for its constitution. At this stage there is an addition of grape spirit, and the brandy most congenial to the wine is that distilled from the wines of Cognac where the finest dist. is as chalky as C. and bears the same name (see BRANDY). Moreover the wine has by this time converted nearly every trace of sugar into alcohol and gas, and must be sweetened by a liqueur formed of the brandy with from a quarter to 5 per cent of sugar to make it *brut* (or nature), *extra sec* (or

extra dry), *sec*, or *demi-sec*; for the French, who to-day drink the bulk of C., like their wine sweet to go with the sweets, and the English like it dry to go with their meals, knowing, perhaps, that only the best wine will pass muster when it is practically unsweetened. Modern methods of vinification have given C. an almost uniform golden colour; pink C.s are made by the addition of a little red wine or colouring matter. A good deal of red and white still C. used to be made and it will no doubt reappear if the demand for the expensive sparkling wine



Pommery & Greno

A STORAGE GALLERY IN CHAMPAGNE
CAVES AT REHIMS

falls below the supply of the vintage. Old sparkling C.s can be wonderful wines, but they are bound to be rare as their existence depends on first-rate corks and careful storage. See Pacottet and Guittoneau, *Vins de Champagne*, 1918; H. Warner Allen, *White Wines and Cognac*, 1952; A. Muir, *How to Choose and Enjoy Wine*, 1953.

Champagnole, Fr. tn in the dept of Jura, on the Ain. It is a popular resort. There are metallurgical and watch-making industries. Pop. 5000.

Champaign, city in Illinois, U.S.A., 125 m. SSW. of Chicago, in a grain-growing and livestock area, with railway shops and an oil refinery. With adjoining Urbana, C. is the prin. seat of the univ. of Illinois. It manufs. gloves, machinery, chemicals, etc. Pop. 39,600.

Champ-de-Mars, park in Paris on the l. b. of the Seine, now about 50 ac. in

extent, originally a field for military parades and reviews. The Eiffel Tower (q.v.) stands in the NW. corner. It was the site of the celebrated fête de la Fédération on 14 July, 1790, the first anniversary of the fall of the Bastille (q.v.). In 1791 it was the scene of a massacre, and here, in 1804, Napoleon distributed the 'Eagles' (standards) to his army. The international exhibitions of 1867, 1878, 1889, 1900, and 1937 were held here.

Champerico, seaport of Retalhuleu dept, Guatemala, on the Pacific. C. is linked with the Pacific Highway, and is also the terminus of the San Felipe railway. Pop. 1000.

Champerty, or **Champarty** (Lat. *campum partiri*, to divide the land), in criminal law is a species of maintenance or officious intermeddling in a law suit which in no way concerns one. The crime consists in making a bargain with a plaintiff or defendant that, in consideration of the champertor carrying on the action at his own expense, the land or other subject matter of the action shall in the event of success be divided between them. C. is a misdemeanour punishable by fine or imprisonment, or both. It has been held to be a champertous agreement to offer to exercise influence in procuring evidence to support a claim for money upon condition of receiving a portion of the sum recovered. See also CRIMINAL LAW and MAINTENANCE.

Champfleury, Jules Husson (1821-89), Fr. author, b. Laon. His true name was Jules Fleury-Husson or Husson. He joined the Bohemian circle of Baudelaire and Henri Murger, and was an acknowledged leader of the realistic school. His *Bibliographie céramique*, 1882, written after he was appointed director of the Sèvres potteries in 1872, is of some value. Among his novels are *Chien-Cailou*, 1847, which won the praise of Victor Hugo; *Les Souffrances du professeur Deltail*, 1853; *Les Bourgeois de Molinchart*, 1855, a satirical tale of prov. life among the middle classes; *Les Amoureux de Sainte Péline*, 1859; *Le Violon de Falence*, 1862, generally considered his masterpiece. His biographical works include *Honoré de Balzac*, 1852. See M. Clouard, *L'Œuvre de Champfleury*, 1891.

Champigny-sur-Marne, Fr. tn in the dept of Seine, a SSE. suburb of Paris, on the Marne. There were engagements here between the French and the Germans during the siege of Paris in 1870 (see FRANCO-PRUSSIAN WAR). It is a boating resort for Parisians, and has engineering works. Pop. 29,200.

Champion (Late Lat. *campio*, from *campus*, a field or open space), in the judicial combats of the Middle Ages the hired combatant who took the place of women, children, aged persons, or any incapable of fighting their own battles. These Cs were of the lowest class, and were regarded as disreputable persons. Later, in the age of chivalry, the name acquired a higher meaning and was applied to a knight who challenged or defended on behalf of an injured lady or child. The

office of crown C. is peculiar to England. The 'King's C. in full armour and mounted on horseback rode into Westminster Hall at the coronation banquet and challenged to single combat any who should deny the sovereign's right to reign.' The challenge was never accepted, but the picturesque ceremonial was performed up to the coronation of George IV. The office is hereditary and is held by the family of Dymoke.

Championnet, Jean Antoine Etienne (1762-1800), Fr. general, b. Valence in Drôme. He enlisted in the army at a very early age and took part in the siege of Gibraltar. When the revolution broke out he took a prominent part; suppressed the Girondist movement in the Jura (1793) without bloodshed; was brigadier-commander in the Rhine campaign, and by his stubborn resistance at Fleurus (1794) greatly contributed to Jourdan's victory. In 1798 he was appointed commander-in-chief of 'the army of Rome,' defended Rome against the Neapolitans and the Brit. fleet, and finally captured Naples (1798), setting up the Parthenopean rep. there. His intolerance of opposition was the cause of his recall from Italy in disgrace. In the following year he was appointed commander-in-chief of the 'army of the Alps,' but was defeated at Gendia (1799) by the Austrian and Russian troops, and retired to Nice. He d. at Antibes in the following year.

Champlain, Samuel de (1567-1635), Fr. explorer, founder of Quebec and first governor of Fr. Canada, b. Brouage (Saintonge). His youth was spent in the army of Henri IV, and in an expedition to the W. Indies of which he wrote an account in *Bref Discours des Choses plus remarquables que S. Champlain a reconnues aux Indes Occidentales* (first pub. 1870). In 1603 he made his first voyage to Canada. On his third voyage (1608) he founded Quebec, estab. friendly relations with the Indians, and founded a prosperous fur trade. In 1612 he was made lieutenant of Canada. In 1629 Quebec fell into the hands of the British, and C. was taken to England as a prisoner. At the treaty of St Germain (1632), which restored Canada to France, C. returned to Quebec as governor. When C. came to the St Lawrence, furs were already being brought to the riv. from great distances, and C. found himself involved in the intense rivalry for the trade. In his trade and explorations C. had followed a policy of making alliances with Indian tribes, especially with tribes N. of the riv. where the best fur country lay. In 1609, soon after Quebec was founded, C. was already beginning to ally himself with the N. Indians. In that year he made an exploration up the Richelieu R. and into the lake which still bears his name. C. was often hindered in making explorations himself by the cares of the settlement at Quebec; but he sent younger men to live with the Indians and learn their ways and languages. It was through one of these young men, Vignau, that C. was led to make his second important expedition, a voyage, in 1613, up the Ottawa as far

as Allumette Lake. Two years later C. undertook his greatest exploration. This was to the Huron country with Étienne Brûlé, a Quebec youth, in an attack on the Iroquois. C. made the long trip up the Ottawa, across the Mattawa R. to Lake Nipissing and down the Fr. R. to Georgian Bay and thence to a Huron vil. near Lake Simcoe; in the fighting there C. was wounded and his party retired defeated; and in the following year C. went home. Brûlé subsequently carried on the work of exploration. At C.'s death large parts of the great lakes were still unexplored; but C. was the pioneer in the remarkable voyages which first put the great lakes on the map. His men had pointed the way to the Mississippi and found the St Mary's R. and Mackinaw Strait, which were subsequently to be the cross-roads of the great fur-trading routes of the N. and W. Great as he was as an explorer, C.'s fame rests solidly on his writings. To-day these are printed, with an Eng. trans., in 6 large vols. and by a society which bears his name. They are no doubt his best memorials, a valuable and convincing record of the beginnings of Fr. settlement and exploration, besides being an attractive character-study of the man himself. See *Oeuvres de Champlain* (6 vols.). 1870, and *Voyages* (3 vols.), 1878-82; also life by Dionne, 1891; and in *Makers of Canada Series, Champlain*, by Dionne, 1905.

Champlain, lake in the NE. of the U.S.A., lying between Vermont and New York. It is long and narrow, its N. end stretching for nearly 6 m. into Canada. It is drained to the N. by the Richelieu into the St Lawrence, and is connected by a canal with the Hudson. It has an area of about 435 sq. m., being approximately 110 m. long by from 1 to 14 m. broad. To the E. lies the Green Mt. range, to the W. the Adirondacks. The lake was discovered in 1609 by Samuel de C., who gave it his name. It was the scene of many skirmishes during the Fr. and Indian wars, and during the Amer. Revolution. In 1814 the Brit. fleet was defeated by the Americans in the naval war of 1812-15.

Champlain Epoch or Period, name given by Prof. Dana to the period succeeding the Glacial in N. Amer. geology, equivalent to the post-Glacial period of Brit. geologists. The chief traces left by the C. E. are the deposits, including marine shells, round Lake Champlain and elsewhere in N. America, the raised beaches around the great lakes, and old lake basins, now dried up, in their neighbourhood and near the E. coast. The small bitter lakes, the most important of which is the Great Salt Lake of Utah, are the remains of a great system in the W.

Champollion, Jean François, le Jeune (1790-1832), Fr. Egyptologist, b. Figeac, in the dept. of Lot, France. At the age of 16 he read a paper at Grenoble maintaining that Coptic was the anc. language of Egypt. In 1816 he was appointed to the professorship of hist. at the Lyceum of Grenoble, which he was afterwards obliged to vacate on account of his

Bonapartist sympathies. By comparing anc. MSS. and monuments, and inferring that hieroglyphs represented ideas or letters, C. made rapid progress with the decipherment of hieroglyphic writing. He was sent on scientific expeditions to

ben, *Champollion, sein Leben und sein Werk*, 1905.

Champollion-Figeac, Aimé Louis (1813-1894), Fr. author, b. Grenoble, son of Jacques Joseph C.-F. He was assistant librarian to his father at the Royal Library; also pub. sev. works on Fr. hist., art, and palaeography, and edited a number of memoirs.

Champollion-Figeac, Jacques Joseph (1778-1887), Fr. archaeologist, elder brother of the more famous Jean François Champollion, b. Figeac. He became prof. of Greek at Grenoble, and in 1828 was appointed conservator of MSS. in the Royal Library at Paris. In 1848 he was appointed librarian of the palace at Fontainebleau. He wrote sev. works on historical and philological subjects, and was editor of some of his brother's works.

Chamson, André (1900-), Fr. novelist and essayist, b. Nîmes. He was brought up in the narrow Protestant tradition of his region; and although he studied at the Sorbonne and the Ecole des Chartes, his severe upbringing forms the inspiration of some of his best work. In his first novels, *Roux le bandit*, 1925, *Les hommes de la route*, 1927, *Histoire de Tabusse*, 1928, and *Le crime des justes*, 1930, he describes the life of the peasantry in his native region. Later novels show more interest in social and political problems, such as *La Galère*, 1939. He has also written a series of political essays, including *L'homme contre l'histoire*, 1927, and *La révolution de dix-neuf*, 1930. See A. Rousseaux, *Ames et visages du XX^e siècle*, 1932.

Chamusca, tn of Portugal, in Santarém dist., on the Tagus, 14 m. NE. of Santarém (q.v.). It has a trade in fruit, wine, and cheese. Pop. 3600.

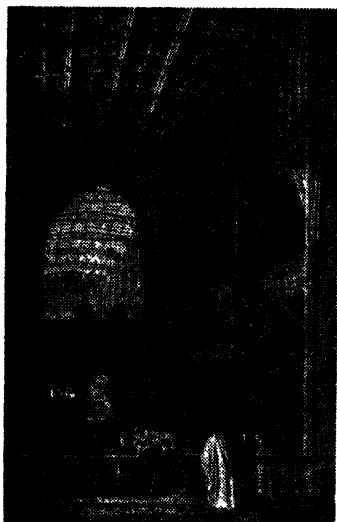
Chañaral, or **Chañaral de las Animas**, coastal tn and cap. of C. dept. Atacama prov., Chile, 75 m. NNW. of Copiapó. It acts as an import-export centre for the important Potrerillos copper-mine. Apart from what can be obtained from condensation, drinking-water has to be piped from hundreds of miles away. Pop. 3000.

Chance, see PROBABILITY.

Chance, or **Chaud-medley** (**Chaud-melle**) (O.F. *chaude melle*, heated affray), originally meant any casual affray accompanied by violence but without deliberation or preconceived malice. The expression, though seldom used now, means the killing of another in self-defence upon a sudden and unpremeditated encounter. C.-M. is to be distinguished from manslaughter, for the latter is a crime, but the former an excusable act. The general distinction is that, if both parties are actually fighting, he who gives the mortal blow is guilty of manslaughter, but if one of them at first refuses to fight and retreats until, at last,

to avoid his own destruction, he kills his antagonist, that is excusable homicide, or, as it is inaccurately termed, C.-M.

Chancel (Late Lat. *cancellus*, a screen), the E. part of a church, usually separated from the nave by an open-work screen or rail. In some medieval churches the screen is very high, so that the congregation is completely shut off. The choir stalls and the rector's pew are in the C., and the communion table on a raised platform at the far end. The term C. is often used as synonymous with choir;



THE CHANCEL OR CHOIR OF MANCHESTER CATHEDRAL, AS IT APPEARED IN 1884
From a drawing by T. Challis.

the C. is also frequently called the sanctuary or presbytery. According to Eng. law the rector has special rights over the C., is entitled to the chief pew, and is liable for all necessary repairs. Parishioners are allowed beyond the screen for the celebration of holy communion and for marriage services.

Chancellor, Richard (d. 1556), navigator; appointed in 1553 as captain and pilot-general of the *Bonaventure*, in the expedition of Sir Hugh Willoughby to search for a N.E. passage to India. The ships were separated in a storm off the Lofoten Is., and C. reached Vardohuus, the meeting-place that had been agreed upon, and after waiting 7 days in vain for the rest of the company, he went on alone into the White Sea, from whence he travelled to the court at Moscow, being well received there, and concluding a treaty that gave freedom of trade to Eng. ships. On a second voyage he was lost in a shipwreck off the coast of Aberdeen.

Chancellor (Lat. *cancellarius*). Primary meaning of *cancellarius* is one who is stationed at the lattice-work of a window or doorway, to introduce visitors, etc. In another sense, *cancellarius* was a kind of legal scribe, so called from his position at the cancelli of the courts of law. The *cancellarius*, under the later emperors and in the court of Constantinople, was a chief scribe or secretary who was ultimately invested with judicial powers and a general superintendence over the rest of the officers of the emperor. All the modern nations of Europe have or have had C.s, though the powers and duties seem to have varied in each. In England the C. was originally the king's chief secretary, to whom petitions were referred, by whom patents and grants from the Crown were approved and completed, and by whom reports upon such matters were, if necessary, made to the king; hence in Saxon times he was sometimes styled *referendarius*. The name C. is said first to occur in Eng. hist. in the time of Edward the Elder, AD 920. In early times, as the C. was usually an ecclesiastic, head chaplain and father confessor to the king, he became keeper of the king's conscience, examiner of his patents, the officer by whom prerogative writs were prepared, and keeper of the great seal. The last ecclesiastic who exercised the office was John William, Archbishop of York, from 1621 to 1625.

The interference of the king, the source of justice, was frequently sought against the decisions of the courts of law; and also in matters which were not cognisable in the ordinary courts, or in which, from the maintenance of protection afforded to his adversary, the petitioner was unable to obtain redress. The Eng. C.'s jurisdiction sprang from this royal discretionary authority (see also CHANCERY and EQUITY). It may be observed that although the Eng. C.'s powers were so closely interwoven with the development of equity he nevertheless possessed at one time a political pre-eminence not only far greater than he enjoys at the present day, but second to none in the state; for on the decline of the office of chief justiciar, the C. succeeded him as the chief minister. The Earl of Suffolk in the reign of Richard II, for example, exercised authority not only over revenue matters, but also over foreign policy. Like the justiciar, however, the office of C. always tended to become a purely legal one. The style of the C. in England is lord high C. of Great Britain. He takes rank above all dukes not of the royal blood, and, next to the Archbishop of Canterbury, is the chief judge in England, and has a seat in the Cabinet. He is appointed by delivery of the great seal, sits on the woolsack, presides at debates in the House of Lords, and goes out with the gov. A Rom. Catholic may not be lord high C. of England. The salary of the lord C. is £10,000 a year, and an ex-lord C. receives a pension of £4000 a year, but on going out of office he usually conducts a great deal of judicial work, presiding in the House of Lords,

sitting as the ultimate court of appeal, and hearing appeals to the Privy Council. In the House of Lords the C. presides as Speaker. He is the guardian of wards in chancery and their property, and has jurisdiction over idiots and lunatics by special delegation from the Crown. He is qualified to sit in the court of appeal, and presides when he sits there, and is the titular head of the chancery div. He appoints the judges of the court of appeal and the high court and the county courts, and may remove county court judges if necessary. He also appoints co. justices of the peace on the recommendation of the lord-lieutenant, bor. magistrates, and commissioners for oaths. At the opening of a new Parliament he signifies the Crown approval of the appointment of the Speaker of the Commons, and reads the queen's speech in the absence of the latter. He has the presentation of various canonries and livings, dispenses a wide patronage in addition to that already noted, exercises a concurrent jurisdiction with the other judges of the superior courts with respect to writs of *habeas corpus* (q.v.), and is, *ex officio*, visitor of all hospitals and colleges founded by the Crown. There was also, before the estab. of the Irish Free State in 1922, a Lord C. of Ireland, whose authority within his own jurisdiction was in most respects the same as that of the lord high C. of Great Britain. His salary was £8000 a year.

In Scotland, as in England, the C. was always a high officer of the Crown and had great authority in the king's councils; and similarly, that authority at length extended beyond its original limits and affected the whole judicial power in the kingdom. But while in England the C. for the most part only carved out for himself a jurisdiction in equity, in Scotland he reached the head of the administration of justice, and sat in a court which dispensed both equity and common law and the course of proceeding in which all the other judicatures were bound to follow. The office of C. of Scotland expired in 1707 when, by the treaty of Union with England, it was provided that there should in future be but one great seal for the U.K. The C. of a bishop is vicar-general to the bishop, and presides over the bishop's consistory court. He must be a barrister of at least 7 years' standing. The C. of the Duchy of Lancaster is an officer who presides in the duchy chamber of Lancaster, adjudicating on equity matters connected with the Crown lands of the duchy. He is one of the titular heads of the Ministry of Agriculture. The C. of a cathedral is one of the 4 chief dignitaries of cathedrals of ancient foundation. The C. of the Exchequer is the prin. finance minister of the Crown. His legal functions are now merely formal, such as presiding at the ceremony of nominating sheriffs. Constitutionally he is the under-treasurer, the office of lord high treasurer being now executed by the Lords Commissioners of the Treasury. His voice, however, may be all-powerful

in connection with the Exchequer, the degree of his political eminence varying with the qualities of the individual who holds the Exchequer seat (see EX-CHEQUER, CHANCELLOR OF). The C.s of the univs. of Oxford and Cambridge are the titular heads of the univs., and are elected by the respective corporate bodies of which they are the heads. Their duties are mainly discharged by a vice-C. The C. of the order of the Garter and other orders of knighthood seals and authenticates the formal instruments of the chapter and keeps the register of the order. **Chancellorsville**, vil. of Virginia, U.S.A., situated in Spotsylvania co., between Richmond and Washington. It was the scene of one of the greatest battles of the Civil war in 1863, when Gen. 'Stonewall' Jackson received his death wound and Gen. Hooker was defeated.

Chancery (Lat. *cancellarius*, chancellor). Before the fusion of common law (q.v.) and equity (q.v.) by the Judicature Act, 1873, the Court of C. was the name given to the court which had the sole administration of equity. Since 1873, when the Supreme Court of Judicature was estab. to exercise the consolidated jurisdictions of the old courts of C., queen's bench (q.v.), common pleas (q.v.), exchequer (q.v.), and the admiralty (q.v.), probate, divorce, and matrimonial causes courts, the administration of equity became competent to all courts of law, and the C. div. now means that side of the high court of justice to which are assigned the trials of certain special causes. As a fact practically all matters falling within its old jurisdiction are still heard in the C. courts. The prin. matters assigned to the C. div. relate to the estates of deceased persons, partnerships, trusts, partition or sale of real estates, specific performance of contracts for the sale of land or other property, the redemption or foreclosure of mortgages, care of infants' estates, cancellation or rectification of deeds or other written instruments, and the construction of wills. It consists at the present day of 7 puisne judges, with the lord chancellor as titular head.

History. The whole course of the gradual evolution of the court of C. is intimately connected with the development of equitable principles; principles which, borrowed partly from the civil and canon law, and partly from the dictates of natural justice, were designed to redress grievances for which there existed no available remedy at common law. The king as the fountain-head of justice enjoyed the prerogative of dispensing justice personally in his royal council (*curia regis*). Later the judicial side of the royal council became specialised in the *concilium ordinarius* acting as a court of appeal and equity, and the chancellor, as the keeper of the king's conscience and the chief legal officer of the council, presided over it in the king's absence. The old court of C. is generally believed to have been estab. in 1348 by an ordinance which vested in the chancellor plenary authority in 'matters of grace and favour.' But whether after 1348 the so-called

court of C. was or was not merely the royal council, sitting in a place called 'the chancery' to hear petitions of 'grace and favour' in cases which the common law could not reach, the chancellor gradually usurped the judicial functions of the council and sat as a judge alone. The power of the court of C. after it ceased to follow the king in 1348 was developed mainly through the chancellor's delegated authority to invent new writs to meet cases for which the common law judges were unable to give redress either because of some defect of principle in the law itself, or because such remedies as it did provide could not avail against the oppression or local influence of one of the parties. During and after the end of the 14th cent. the judicial power of the court of C. increased enormously in spite of remonstrances from the common law judges and the Commons. At the time of Coke it exercised an *ordinary* or common law (*secundum legem et consuetudinem*) jurisdiction and an *extraordinary* (*secundum aequum et bonum*) jurisdiction, in the former giving auxiliary remedies such as discovery of documents in cases otherwise decided on common law principles, in the latter proceeding entirely on grounds of equity. The characteristic features of its proceedings were the summons by subpoena to *appear* and *answer* without any *original writ* to the sheriff, by which means it could reach powerful personages who defied the common law courts, and the *injunction*, by the instrumentality of which it removed causes from the common law judges or reversed their decisions, and committed a plaintiff for contempt who persisted in going on in the common law courts against conscience, and in defiance of the order of the C. court.

The constant struggles between the common law judges and the C. court culminated in the historic contest between Coke and Ellesmere in 1616, when the king pronounced in favour of the chancellor. From that time the court of C. became the dominating power in the judiciary, and the rules of equity were made to prevail over those of common law. Down to the middle of the 19th cent., the business of the court of C. was exercised by the lord chancellor, 3 vice-chancellors, and the master of the rolls, each occupying a separate court. There were also various officials who exercised certain parts of the equitable jurisdiction of the court, who derived their authority from special delegation of one of the C. judges. These were principally the masters in ordinary and the accountant-general. Proceedings in the old court of C. were conducted by *Bill* and *Answer*. The Bill set out the facts as alleged by the plaintiff, prayed for relief, and concluded with a request for a subpoena to compel the appearance of the defendant for examination. The defendant's answer usually contained a demurrer (q.v.) to the Bill, various pleas in reply, and a denial of the truth of the allegations, with his own version of the case. Scientific precision indeed was completely subordinated to conscience,

but the true spirit of equity was in a measure violated by the gradual tendency of the procedure to as complete a technicality as that of the common law. The partial fusion of administration of equitable remedies effected by the Judicature Acts has to a great extent modified the excessive technicality of the C. court, or its modern representative the C. div. It may be noted that in most Brit. colonies there are courts of C. based more or less on the model of the Eng. courts. In Amer. law it also indicates a court of general equity jurisdiction. Separate courts of C. or equity exist in a few of the states; in others the courts of law sit also as courts of equity; in others equitable relief is administered under the forms of the common law; and in yet others the distinction between law and equity has never existed or has been formally abolished. The Federal courts exercise an equity jurisdiction as understood in the Eng. courts about 1689. See also BILL in EQUITY.

Chanctonbury Ring, hill on the S. Downs, in Sussex, England, near Steyning. Its tree-capped summit (814 ft) is occupied by prehistoric earthworks and a dewpond. The oval rampart which defended it is 500 ft by 400 ft, and its outworks measure nearly 400 ft. Rom. coins and other remains were found in 1909.

Chanda, tn in Madhya Pradesh, India. It is surrounded by the ruins of the ancient city of Bhadrachal. It was for long the cap. of the Gond kings, of whom a number of tombs remain.

Chanderi, tn in Madhya Bharat, India, in the former Gwalior state. The old tn is deserted and hidden in thick jungle, having ruins of 10th-cent. temples. The modern tn, 8 m. S., is famous for its silks and gold brocades.

Chandernagore, or properly **Chandarnagar** (city of sandalwood), former Fr. settlement in W. Bengal, India, 20 m. N. of Fort William, Calcutta, on the r. b. of the R. Hugli. It was transferred to India in 1951 following a referendum among the inhab. Founded by the French in 1673, it changed hands between French and British, but was finally restored to the French in 1815.

Chandigarh, new cap. of the Punjab (India), built to the design of Le Corbusier on a site 150 m. N. of Delhi at the base of the Shivalik Hills and named after a temple dedicated to the goddess Chandi. The lay-out follows the principle of self-contained neighbourhood units to take a total pop. of 150,000, with a 5-m. green belt around. Notable buildings are those of the Capitol, university, stadium, town hall, and hospitals.

Chandler, Ellen Louise, see MOULTON.
Chandler, Richard (1738-1810), classical archaeologist, b. Hants. He was educ. at Winchester and at Queen's and Magdalen, Oxford. In 1763 he pub. a detailed description of the Oxford marbles in his *Marmora Oxoniensia*, which was printed at the expense of the univ. In the following year the Society of Dilettanti sent him out with Revett and Pars to study the antiquities of Greece and Asia

Minor. On his return C. pub. his discoveries in *Ionian Antiquities*, 1768-97, *Inscriptiones Antiquae*, 1774, *Travels in Asia Minor*, 1775, and *Travels in Greece*, 1776.

Chandler, Samuel (1693-1766), non-conformist divine, b. Hungerford, Berks, where his father was minister. He was educ. at Gloucester, where he met his life-long friend, Bishop Butler. He became fellow of the Royal and Antiquarian Societies, and D.D. of Edinburgh and Glasgow. He was minister at Peckham, 1716-26, then preached at the Old Jewry until his death. His writings were numerous, and he was prominent in the deist controversies of the time.

Chandos, Eng. family, claiming descent from a follower of William the Conqueror: *Sir John Chandos* (d. 1428) was the last representative in direct male line.

Sir John Brydges, descendant in the female line, was lieutenant of the Tower under Queen Mary, and was created Baron C. in 1554.

James Brydges, 9th Lord C., was created duke in 1719. The C. residence which he built once at Canons, near Edgware, is now destroyed. The daughter of the 3rd Duke of C. married the Marquess of Buckingham, who became Duke of Buckingham and C., 1822. In 1889 this title became extinct. In 1954, however, Oliver Lyttelton was created Viscount C. (see CHANDOS, OLIVER LYTTELTON, 1st VISCOUNT).

Chandos, Oliver Lyttelton, 1st Viscount (1893-), Brit. statesman and industrialist, educ. at Eton and Trinity College, Cambridge. From 1940 to 1954 he was Conservative M.P. for Aldershot. In the Coalition Gov. during the Second World War he was president of the Board of Trade, 1940-1; minister of state, 1941-2; and minister of production, 1942-5, his work in the last-named office being outstanding. When the Conservatives returned to power in 1951, C. became secretary of state for the colonies. His period of office coincided with the Kenya Mau-Mau crisis, in which C. displayed considerable political ability and understanding, though he was criticised as reactionary by left-wing opponents at home and as over-progressive by right-wing critics in Kenya itself. In 1954 he retired from politics to devote himself to his substantial business interests, and was created Viscount C. Since 1955 he has been chairman of the Advisory Development Council for N. Ireland.

Chandragupta, or **Sandrocottus** (reigned 316-292 bc), founder of the Maurya empire and first emperor of India. He was son of a king of Magadha, his mother being of humble birth. As a youth he was forced into exile by his kinsfolk, and during this period he gathered round him a great company of warriors, then attacked the Macedonians, and conquered the Punjab. He next attacked Magadha, slew the king, and estab. himself on the throne, and in due time his kingdom extended from the Hindu-Kush to the Bay of Bengal.

Chang, name given to the Tibetan

plateau which breaks up about the meridians of 84°-86° E. Scientific investigations have not been systematically carried out in this region as yet, but it is known that the Himalayan tribes of the Brahmaputra derive their sources from the Tibetan plateau.

Chang Chih-tung (1837-1909), Chinese scholar and statesman, b. in the prov. of Chih-li. From 1889 to 1907 he was viceroy of Hukwang. In character he was a great dreamer and enthusiast, and very impractical. He had great literary powers, and his knowledge of the Chinese classics was unrivalled. He is said to have been one of the most able men in modern times, and his powerful personality and true patriotism won for him a high position in the regard and trust of his fellow countrymen.

Chang Tso-lin (1870-1928), Chinese marshal and leader of one of the Chinese factions. Born of humble parentage and a native of Fengtien prov., Manchuria. Joined the Jap. cause in the Russo-Jap. war, 1904-5; became ruler of Manchuria in 1915. In 1925 he defeated W'u Pei-fu, and set up a gov. in Peking in 1927. In 1928 he withdrew with the intention of going to Mukden, but the train in which he was travelling was bombed by the Japanese near Mukden and his injuries led to his death on 3 June.

● **Ch'angan**, see SIAM.

Changarnier, Nicolas Anne Théodule (1793-1877), Fr. general, b. Autun. He was for many years governor-general in Algeria, and served in the Sp. war, 1823. He later on obtained a military post in Paris, where he subdued the Communist struggles of 1849. He was arrested in 1851 for opposing Napoleon III, and exiled from France, to which he returned 8 years later, after the settlement of 1859. He joined with Bazaine in the war of 1870, and when the tn. of Metz was captured he was taken prisoner and sent to Germany.

Changchow, Chinese coastal city in the prov. of Fukien, about 28 m. W. of Amoy. It has manufactories of bricks and sugar, and a great silk trade.

Ch'angchow, or **Wuchin**, city in Kiangsu prov., China, on the Shanghai-Nanking railway, in a fertile dist. near the Grand Canal. Rice and silk are produced, and there is a prosperous textile industry.

Change (derived from Low Lat. *campium*, exchange), meeting-place for merchants. The name has been thought to be an abbreviated form of exchange and is written thus—change, but this is incorrect.

Changeling, fairy infant substituted for a human one immediately after its birth. In olden days a child that was especially pevish was regarded as a C. Great precautions were taken in the guarding of the mortal infant, and often some charm was left in the cradle. It was supposed the exchange could only take place before the christening, and that afterwards the mortal infant was safe.

Changliakau, see KALGAN.

Changkufeng, hill on the Russo-Manchurian border notable as the scene of

a savage conflict between Soviet forces and the Japanese in 1938. Between the frontier of Jap.-controlled Korea and the Soviet area S. of Vladivostok was a sort of no man's land whose precise limits had never been clearly determined. In June 1938 the Japanese learned that the Russians were planning to estab. a new submarine and air base on Possiet Bay, at the extreme S. limit of Soviet ter. Hence they seized a hill called C, situated in the no man's land about 20 m. from the sea, which gave artillery control over Possiet Bay. The Russian frontier guard expelled the Jap. patrol which had seized C. The Japanese returned in strength and annihilated the Russian frontier guard. The Russians countered in turn, and within 10 days 2 large armies each of 80,000 men, with planes, tanks, and heavy guns, were fighting for possession of the narrow ridge of C. The battle was won by Russian dive-bombers whose pilots had learned the methods of *blitzkrieg* in the Sp. Civil War, and by Russian infantry, which drove the Japanese into the valley below. Although the battle attracted but little attention from the rest of the world, it was an important conflict in its implications. Each antagonist evidently thought that the other was bluffing, but when the fight had developed from a mere frontier skirmish into a savage battle, both sides seem to have realised that the bluff had gone far enough, and an 'amicable' settlement was reached, by which, however, the Japanese, for the first time in Russo-Jap. hist., abandoned a field of battle. They recognised that the ridge of C. was Russian ter. and withdrew discomfited to the valley lying 5 m. to the SW.

This episode gave the Kremlin the assurance that the Red Army in Siberia was neither impotent nor demoralised at a time when the peak of misunderstanding between Soviet Russia and the rest of the world was attained. The following year the Japanese tried again, on the even more vague border-line between Inner Mongolia, which they controlled, and Outer Mongolia, controlled by the Soviet, at a place called Nomanhan. In this struggle the brunt was borne by native levies, although regular Jap. and Russian troops, with planes, tanks, and artillery, were engaged. In a 'war' which lasted 6 weeks, the Japanese were again defeated and again withdrew from the field. The C. affair confirmed Stalin's belief that the Soviet had been strengthened by the notorious army purge of 1936-8. He now knew, despite foreign prejudices, that his long-drawn internal struggle in Russia had been won and his Red Army in the E. could deal with the Japanese. The sequel was the pact of friendship and non-aggression between Russia and Japan in 1941. There was no real friendship on either side, but actually a salient example of 2 countries following a policy dictated solely by their own interests. The pact was scrupulously observed for some years and led to the settlement of such vexed questions as the frontiers between Manchukuo and Korea and the

border between Inner and Outer Mongolia, which had never previously been determined. See W. Duranty, *U.S.S.R.: the Story of Soviet Russia*, 1944.

Changpaishan, Laoling, or Shanalin Mountains, mt range in the prov. of Kirin, China. It stretches in a N.E. direction between Kirin and Korea, the altitude being 8000 ft. Two rivers have their source in the mts, the Sungari on the N. side and the Yalu on the S.

Ch'angsha, cap. of Hunan prov., China, at the confluence of R.s Hsiang and Liu, on the Canton-Hankow railway. C. is an ancient city dating back to the 5th cent. BC, and it has occupied a strategically important position throughout the ages. Situated in the centre of a dist. rich both in agric. products and minerals, it has a prosperous trade, exporting rice, coal, antimony, etc. It was opened as a treaty port in 1903, but its foreign trade has been much overshadowed by Hankow. The commercial quarters are in the N. and W. of the city, while the S. part is occupied by factories. The Yoloshan in the SW. is one of the sacred peaks of the Hangshan and at its foot was the Yolo Academy founded in the 12th cent., which is now the site of the Hunan Univ. The temple of Chia Yi (201-169 BC) inside the city walls is believed to be his old house. The city was almost completely destroyed by fire started by Chiang Kai-shek's stampeding troops in face of the invading Japanese in 1938; but it withstood 3 subsequent Jap. offensives between 1938 and 1943. The present city was almost completely rebuilt after the war and much industry has been built up since 1953. Pop. 630,000.

Changteh, see ANYANG.

Ch'angsha, Chinese city in the province of Hunan situated on the R. Yuan, which is the chief means of communication from the neighbouring province of Kweichow.

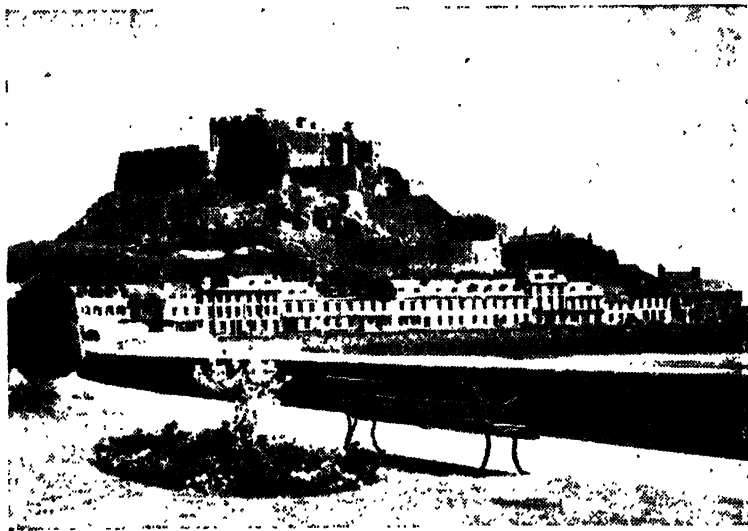
Ch'angtu, see CHAMDO.

Channel, English, see ENGLISH CHANNEL.

Channel Islands (Fr. *Iles Anglo-Normandes*), group of Brit. is. in the Eng. Channel, W. of the Cotentin Peninsula, NW. France. The largest is. are Jersey and Guernsey; the lesser inhabited is. are Alderney and Sark. Herm, Jethou, and Brechou have, from time to time, a few inhab. Outlying rocky islets or reefs include Burhou, the Casquets, the Dirouilles, the Ecréhos, Lihou, the Minquiers, and the Paternosters. Chausey, an extensive rocky reef, with a few inhab., lies SW. of Jersey but belongs to France. Navigation around the coasts is difficult owing to rocks, tides, and currents. The area of the 4 main is. is about 75 sq. m. The total pop. is nearly 103,000, mostly centred in Jersey and Guernsey. The is. formed part of the duchy of Normandy at the time of William the Conqueror's invasion of England in 1066. They were not included in the Eng. continental possessions lost to France in 1204 in the reign of King John, and remained attached to the Brit. Crown, of which they are the oldest possession. The is. remained, however, in the diocese of

Coutances (Normandy) until 1568, when they were brought into the diocese of Winchester. Their strategic importance in the past and their effectiveness as privateering bases brought attacks by the French, the last in 1781, when a landing force under de Rullecourt was routed by the Eng. garrison and the local militia in the battle of Jersey, commemorated in a painting by Copley, hung at the Tate Gallery, London. Under conditions of modern warfare the is. are untenable against a powerful enemy in occupation of the mainland of France, and shortly

home secretary. The bailiff in each bailiwick is also appointed by the Crown and combines the functions of chief magistrate and president of the legislature. Each of the 4 is. has its own legislature and courts. The laws and customs and political institutions vary in each is., but are all based on those of medieval Normandy, though modified in many respects by local legislation. Sark is unique in being still almost entirely feudal. The is. have shown great attachment to their traditional laws and forms of gov., both sustained in the past by the common use of



MONT ORGUEIL CASTLE, GOREY, JERSEY

after the collapse of France in June 1940, they were declared by the Brit. Gov. to be open tns, and were occupied by Ger. forces. They were heavily garrisoned and fortified by the Germans, but wore of little positive value to them during the war. They were peacefully liberated in May 1945. The is. have long enjoyed full self-gov., subject only to the queen-in-council; they are not represented in the Parliament at Westminster and are not subject to it. The is. are divided into 2 bailiwicks: one for Jersey and one for Guernsey, Alderney, and Sark, Alderney being governed almost entirely by Guernsey, but Sark retaining a high degree of independence within the bailiwick, with direct appeal to the queen-in-council on some matters. Alderney has an elected president. A lieutenant-governor represents the queen in each bailiwick and is the formal channel for communication between the is. and the

the Norman language, still spoken with variants in vocabulary and accent in most of the is. Until recent times French was used exclusively in the legislatures and courts, but English is now in general use. In 1946 a committee of the Privy Council visited Jersey and Guernsey and approved substantial changes, already proposed by the islanders, in the composition of the legislatures in Jersey and Guernsey, and also approved the setting up of an appeal court for both bailiwicks. The reforms in Jersey have now been constitutionally adopted, but in Guernsey they have been rejected. The C.I. enjoy a mild climate, with moderate range and with record sunshine periods during the summer; ann. rainfall varies from 34 in. to 38 in. They have developed an intensive agriculture and a flourishing holiday traffic from England, the latter activity centred mainly in Jersey and Guernsey. The is. attract as residents many *rentiers*

and Eng. folk living in retirement from service overseas. Glasshouse culture has developed extensively in Guernsey, because the is. slopes northwards and is therefore less favoured than Jersey, which slopes southwards, and where outdoor intensive cultivation prevails on small holdings seldom exceeding 20 ac. The is. enjoy long-standing privileges of exporting their crops—potatoes, tomatoes, fruit, and flowers—to the U.K. free from import taxes. Jersey and Guernsey also export considerable quantities of granite. The is. are the homes of the well-known Guernsey and Jersey breeds of cattle. The herds are strictly controlled and are virtually free from tuberculosis. The large proportion of local production exported from Jersey and Guernsey gives rise to large imports from the U.K. of food, coal, motor vehicles, feeding stuffs, fertilisers, packing materials, horticult. requisites, hardware, and general goods. Jersey and Guernsey are served by regular steamer from Southampton and Weymouth and air services from the U.K. Sark and Alderney have regular trade and communications with Guernsey and there is a regular daily air service between Alderney and England. Trade between France and the is. is insignificant and there is a steamer service only from Jersey. Eng. currency of all denominations is used, and the 'big five' Eng. banks are estab. Jersey and Guernsey make token issues of their own copper coinage. During the Ger. occupation (1940-5) they issued their own currency notes and postage stamps. A large part of the administration of the is. is carried out on a voluntary basis, which, with the frugal character of the islanders, accounts for the comparatively low taxation and relatively small public debt in each is. Taxation is, however, tending to rise to meet social legislation of various kinds. The is. have a rich flora and offer much of geological and archaeological interest, Jersey having a remarkable megalithic tomb, La Hougue Bie, and a cave, La Cotte de St Brelade, which has revealed evidence of Neanderthal man. See ALDERNEY; CASQUETS; GUERNSEY; HERM; JERSEY; JETHOU; SARK. See T. D. Kendrick, *The Archaeology of the Channel Islands*, 1928; B. de Guerin, *The Norman Isles*, 1948; H. M. Lockley, *The Charm of the Channel Islands*, 1950; W. D. Hooke, *The Channel Islands*, 1953; A. and Mary Wood, *Islands in Danger*, 1955.

Channel Ports. Ger. designs on the C. P. became obvious in the early months of the First World War. Possession of them would have given Germany bases for submarines, besides offering favourable conditions for cutting Brit. communications with France. Hence the Ger. plan was to capture Dunkirk, Calais, and Boulogne and also the Belgian ports, Zeebrugge and Ostend. The menace was increased after the fall of Antwerp on 9 Oct. 1914, when the Germans concentrated 3 armies for a general offensive towards the straits of Dover. Ostend and Zeebrugge were evacuated and the Belgian Army retreated to the Yser. In the last

days of Oct. the 3 Ger. armies delivered a formidable and almost simultaneous attack on the allied front extending from the Yser R., through the Ypres sector and La Bassée, to Arras. This was the inception of the first battle of Ypres, and upon its issue hung the fate of the C. P. At the beginning the sorely tried Belgian Army bore the brunt of the attack, stubbornly resisting Württemberg's troops behind the Yser until such time as the Brit. warships were in position to fire on the Germans, and so compel them to withdraw. Between Nieuport and Ypres, further inland, the advance was thwarted by the desperate expedient of opening the dykes and so flooding the surrounding country. The sole gain to the Germans in this quarter was the capture of Dixmude. Southward, the second Ger. Army, that under the Bavarian crown prince, after sev. days of fierce fighting, succeeded in advancing its positions a few miles, from La Bassée to Neuve-Chapelle; but this proved the limit of its advance to the C. P. The third Ger. Army, under von Bülow, operating still further S., could make no headway against the French in front of Arras. The fiercest fighting in the whole battle was near Ypres, the attacks on the Brit. forces being repeated and long-drawn; but though the Brit. line was driven back some little way, it was never pierced. The historic effort of the Germans to take the C. P. had thus definitely failed. A further effort was made in 1918 in the course of the final Ger. offensive, but the attack was launched from motives of despair. When they were held before Amiens (q.v.), the Germans delivered a great assault against the Brit. line between Arras and the region N. of Ypres, the plan being to separate Plumer's Second Army from Horne's First Army, the attempt to drive a wedge between the French and British having failed. Success would have jeopardised Calais, for an advance in any way comparable to that already made in the Amiens sector would have involved first Hazebrouck and then Ypres. But though the British sustained a terrific battering at Passchendaele Ridge, and lost many important positions, they still dominated the strategic railway lines from and to Amiens, Arras, and Ypres, and the Germans, despite heavy losses, were no nearer the C. P. At the same time, too, they had lost the Belgian ports as effective bases for U-boat operations, owing to the Brit. Navy sinking ships in the harbours of Ostend and Zeebrugge (q.v.).

Second World War. In the Second World War all the C. P. were taken by the Germans in the course of the campaign on the W. front in 1940, and on 21 May the R.A.F. were attacking some of the ports which were then in Ger. hands. Boulogne was taken by the enemy on 24 May. Ostend fell on 29 May, and on 30th the Brit. expeditionary force was evacuated from the Dunkirk beaches. See also WESTERN FRONT in SECOND WORLD WAR.

Channel Tunnel. M. Mathieu, a Frenchman by birth, was the first to propose submarine communication with England.

He laid the suggestion before Napoleon I that a roadway should be built under the Eng. Channel, and that locomotion should be carried on by means of horses. After railways had come into vogue, it was suggested by some Eng. and Fr. engineers that a tube should be laid along the bed of the sea. Wm Low, in 1867, thought that 2 single-line tunnels, with numerous passages to connect them, could be engineered. At the Paris Exhibition (1867) a model of a tunnel was shown by Thomé de Gamond, and in 1872 the Eng. C. T. Co. was formed. The scheme was set on foot, and operations begun at Sangatte, near Calais, and Shakespeare's Cliff, near Dover, headways having been bored for 2000 yds under the sea at each end. But the Eng. military authorities refused to sanction it, and Parliament opposed the scheme. During the experimental proceedings coal was discovered near Dover. In May 1904 the Paris chamber of commerce passed a resolution strongly advocating the scheme, and the C. T. Co. showed intention of once more approaching Parliament on the subject. The military authorities were loath to permit of any project that would deprive Great Britain of the advantages due to her insular situation. But in the 20th cent. new factors came into being. First was the invention of the aeroplane; especially after Blériot had flown over the Eng. Channel in 1909, Britain was no longer an island. Next came the First World War with the submarine warfare of Germany on Brit. shipping, which greatly hampered the forwarding of supplies to the Brit. Army and its allies. After the war the allied generalissimo, Marshal Foch, is reported to have stated that had the C. T. been in existence in 1914 the war might have been shortened by one-half, and that such a tunnel 'would make war in W. Europe impossible.' The Brit. generals, Lord French, Lord Kitchener, and Sir Henry Wilson, declared, on the contrary, that the tunnel would have been a handicap in the war. Among economic factors that led after the war to a revival of the agitation in Great Britain in favour of a C. T. was the idea that the undertaking of so large a scheme would assist trade and employment and that it would encourage tourists, fearful of sea-sickness, to visit England. For this reason the great London drapers advocated the scheme, and some London newspapers lent their support. The rival scheme of a channel train ferry, which became an actuality in 1918, is an economic factor adverse to the tunnel, and the increasing air transport has led to further doubts. A committee appointed by the Labour administration reported in 1930 that there were certain economic advantages in the scheme, but on 30 June of that year the House of Commons, taking its cue from the Premier, MacDonald, rejected the project by the narrow margin of 179 votes to 172. The Fr. Gov. still attaches great importance to the scheme. The Brit. scheme was for a tunnel 30 m. long (of which 20 would be under the sea), costing about £30,000,000 and taking

5 or 6 years to build. M. Dautry, chairman of the Fr. C. T. Committee, suggested much the same length and cost, the depth of the lowest portion of the tunnel in his scheme being about 300 ft below sea level, and he quoted a Franco-Brit. expert agreement to the effect that the receipts for the first year would be about 577,000,000 francs and that the tunnel would be financially self-supporting. Just before the Second World War, M. André Boisdevant aroused interest by his detailed plans for a 30-m. road tunnel with a road width of 22 ft and a height from road level to roof of 18 ft, the deepest point being 450 ft below sea level, and the route being from Marquise, under Cap Gris Nez, to near Folkestone, the estimated cost being £42,000,000. Apart from the glacial moraine which is said to exist in the centre of the channel there appears to be no insuperable difficulty from the engineering standpoint in the construction of a C. T., the chalk substratum of the channel bed being eminently favourable to boring operations. At the time of going to press renewed interest was being shown in the C. T. project. Conversations were taking place between the Suez Canal Co. and the C. T. Co. in London with a view to closer investigation of the possibilities of a C. T. The exact form such a tunnel would take is not yet clear, but it is possible that both rail and road communications would be assured. Talks on a European common market, together with post-war tendencies towards a united Europe (for political implications see WESTERN UNION), favour the reconsideration of a scheme for a submarine link with the Continent, though it is clear that the Brit. and Fr. govts. would be deeply implicated were the project accepted.

Channing, William Ellery (1780–1842), eminent Amer. Unitarian preacher and writer, b. Newport, Rhode Is. He graduated at Harvard in 1798, and in 1803 became minister of the Federal Street Congregational Church, Boston, where he acquired a great reputation for eloquent preaching. C. became involved in a controversy in which he was called the 'apostle of Unitarianism,' although he himself objected to the term. C. had a gentle nature, and shrank from eccles. quarrels, and had little sympathy with those who preached dogma, of whatever kind. He preached and wrote vehemently against intemperance, war, slavery, and oppression. While on a visit to Europe he met many Eng. authors, notably Wordsworth and Coleridge. His works include *Remarks on National Literature*, 1823, *On the Character and Writings of John Milton*, 1826, *On the Character and Writings of Fénelon*, 1829, an essay on *Slavery*, 1835, and *Self-Culture and the Elevation of the Masses*, 1838. His complete works were pub. in 5 vols. in 1841, and in 1875 were reprinted in 1 vol. His sermons were collected and pub. in 1872. See life by his nephew, Wm Henry C., 1848, and that of J. W. Chadwick, 1903.

Channing of Wellborough, Francis Allston, 1st Baron (1841–1926), politician,

b. in the U.S.A., and educ. at Exeter College, Oxford. He later became tutor and lecturer in philosophy at Univ. College. He was Liberal M.P. from 1885 to 1910, and took an active part in promoting agric., educational, and labour reforms. His pubs. include *The Truth about Agricultural Depression*, 1897, and *Memories of Midland Politics*, 1917. He was made a peer in 1912.

Chansons de Geste (Lat. *gesta*), name given to long narrative poems written by the *trouvères* of N. France from the 11th to the 15th cent. in number about 110, according to Gautier. The earliest known chanson in existence, the *Chanson de Roland*, is by far the most famous and noblest of them all. It appears to have been written between the years 1066 and 1095. Most of the C. are divided into 3 cycles, that of Charlemagne, of Doon de Mayence, and Garin de Montglane. Probably the most important cycle was that one which gave an account of the doings of Charlemagne, and was known as the *Geste du Roi*. It described the life of the mother of Charlemagne, as well as that of the emperor himself. Another interesting cycle is that of *La Geste de Guillaume*, which tells of the brave men of the S. who render faithful service to the throne. There are a great number of poems belonging to this cycle, and they are some of the earliest extant. The subjects of these *chansons de geste* are nearly all taken from Fr. hist., and written in verses of 10 or 12 syllables. Their general character is inclined to hardness and coarseness, and very little grace, but there is great energy; they are full of Gallic strength and force. Their literary value and historical interest are very considerable; the customs and ideas of the times in which they were written are faithfully reproduced, and their popularity spread into England, Italy, Spain, and even Iceland. Very many of the surviving poems were never pub. See J. Bédier, *Les Légendes épiques*, 1908-17. See also FRENCH LANGUAGE AND LITERATURE. Literature.

Chant, Laura Ormiston, née Diddin (1848-1923), social and political reformer. She was b. at Chepstow, and prior to her marriage had been assistant matron in an asylum and also a schoolteacher. She lectured in different parts of the world on women's suffrage, temperance, liberalism in politics, and many other subjects. In 1895 she began to attack the London music-halls on the ground of social purity. She was a writer of songs and of pamphlets on social questions.

Chant, in church music a species of melody used in cathedrals and other churches. In the Church of England the psalms are usually chanted, while in some nonconformist churches certain passages of Scripture are also chanted. In the Rom. Catholic Church the earliest form, the Ambrosian C., introduced by St Ambrose of Milan, was superseded by the Gregorian C. or plainsong system of antiphonal psalmody as devised by Pope Gregory I. In this system 8 groups of chants correspond to the 8 modes (q.v.)

or church tones. The C. begins with an intoning note and then a reciting note is followed by the meditation marking the half of the C., a reciting note, and the termination. In the Anglican C. the main principle is that of the traditional Gregorian tones. See also PLAINSONG; PLAINCHANT; GREGORIAN CHANT.

Chantabun, prin. tn of the prov. of C., on the E. side of the Gulf of Thailand. It has been a stronghold of the Rom. Catholic missionaries since the 17th cent., and is considered to possess a stronger Christian element than any other place in Thailand (Siam). There is considerable export trade in rosewood, dye-woods, timber, hides, gum, and horns, and there are mines of precious stones in the vicinity. Pop. 110,808.

Chantada, Sp. tn in the prov. of Lugo, on the Asma, a trib. of the Miño (q.v.). It is an important agric. centre. Pop. 15,000.

Chantarelle, see CHANTERELLE.

Chantelaure, François Régis (1821-88), Fr. historian, b. Montbrison, Loire. The majority of his pubs. deal with the 17th cent. His most important are *Le Cardinal de Retz et l'affaire du chapeau*, 1878, then in 1879, *Le Cardinal du Retz et ses missions diplomatiques à Rome*. He had previously pub. (1876) *Marie Stuart: son procès et son exécution*, which is still an important authority on this subject.

Chantenay, until 1908, a tn of France in the dept of Loire-Inférieure, situated on the R. Loire, 2 m. W. of Nantes of which it now forms part. There are large brandy distilleries, iron foundries, forges, shipbuilding works, etc.

Chanterelle, Chantarelle, and **Chantarella**, popular renderings of the name *Cantharellus cibarius*, an odible mushroom; in colour it is a bright orange, the cap is irregularly shaped, the gills are thick and wrinkled, and the whole plant has a pleasant fruity smell.

Chantilly, Fr. tn in the dept of Oise, on the Nonette, 25 m. N. of Paris, beside the beautiful forest of C. The magnificent Grand Château is a 19th-cent. reconstruction by Henri, duc d'Aumale (q.v.), of a historic structure, once the property of the great Condé (q.v.), which was destroyed at the revolution. In 1886 the duke presented it and its invaluable art collections to the Institut de France. C. has a famous racecourse, and gives its name to a kind of lace. Pop. 6000.

Chantrey, Sir Francis Legatt (1781-1841), sculptor, b. Norton, Derbyshire. The son of a carpenter, he was left an orphan at the age of 12, but was befriended by a wealthy lady, and in 1797 apprenticed to a wood-carver, frame-maker, and glider in Sheffield. Here he began modelling in clay and drawing pencil sketches, which attracted the attention of John Raphael Smith, the mezzotint engraver, who gave him some lessons in portrait painting. In 1803 he came to London and studied at the Royal Academy, where his first work, a 'Portrait of D. Wale, Esq.', was exhibited in 1804. His work was well received, so that in 1809 he obtained a commission to execute

colossal busts of Brit. admirals—Howe, Vincent, Duncan, and Nelson—for Greenwich Hospital. In 1808 he received an order for a statue of George III to be placed in the Guildhall. His reputation for portraiture was estab., and he executed busts or statues of most of the prominent men of his time. His busts include those of Sir Walter Scott (two, 1820 and 1828), James Watt (Westminster Abbey), and Wordsworth; his chief statues are Sir Joseph Banks (1827), Washington (in Boston), the Duke of Wellington (in front of the Royal Exchange, London), George IV, Canning, and Roscoe (Glasgow). His statue-group of the 'Sleeping Children' in Lichfield Cathedral is well known. C. was knighted in 1835 and he bequeathed his fortune to the Royal Academy, to be partly expended on the purchase of works of art executed in Great Britain. See J. Holland, *Memorials of Chantry*, 1851; G. Jones, *Sir Francis Chantry*; D. S. MacColl, *The Administration of the Chantry Bequest*, 1904.

Chantry Bequest. This fund was estab. by the bequest of Sir Francis Chantry, R.A. (q.v.), under which £105,000 was invested in consols, the available income being then about £3000. The first purchases out of the fund were made in 1877, and the collection, which now comprises some 500 works, has since 1898 been permanently housed in the Tate Gallery. In 1903 complaints with regard to the Chantry bequest were raised on the ground that the committee was too exclusive in its choice of artists, and since then various changes have been made in the composition of the selection committee. The exhibition of the Chantry Collection (Royal Academy, 1949) suggested that early criticisms were well founded but showed later improvement. The selectors form 2 joint committees for painting and sculpture, each composed of 3 members of the Academy and 2 of the Tate Board; proposals for purchase come before the Academy Council, who retain the power of approval or rejection.

Chantry (O.F. *chanterie*; Lat. *cantare*, to sing), term applied to a chapel or altar where masses may be sung for the repose of a soul. C. chapels are often built off the aisle or nave of a church, and have the tomb of the founder placed in the centre. The word C. is also applied to the endowment intended by the founder as a perpetual stipend for masses in such a chapel. See G. H. Cook, *Medieval Chantries and Chantry Chapels*, 1941.

Chanuach, Jewish minor festival commemorating the rededication of the Temple in 164 BC by Judas Maccabeus after his defeat of the forces of Antiochus IV. It is celebrated for 8 days from Kislev 25, chiefly by kindling lights in the Jewish home and at the synagogue.

Chanzy, Antoine Eugène Alfred (1823–1883), Fr. general, b. Nouart, Ardennes. He was present at Magenta and Solferino in 1859. He had about 30 years' service in Africa, on his return from which he commanded the second army of the Loire in the Franco-Prussian war in 1870. He was ambas. to Russia, 1879–81, and was

nominated as president of the rep. in 1879.

Ch'aochow, city of China, in Kwangtung prov., situated on the R. Hankiang, near where it flows into the China Sea.

Chaoking, city of China, in Kwangtung prov. It is situated on the West R.

Chaones, people who lived in Epirus in the N. of Greece; thus Epirus is occasionally called Chaonia.

Chaos, according to the Greeks the space and void which existed before creation (literally 'a yawning'). C. was said to be the mother of Erebus and Nyx (Darkness and Night).

Chapala, largest lake in Mexico (central) with an area of 1300 sq. m., situated between Guadalajara and Michoacán. There are numerous is., and the Río Grande de Santiago (which enters it as the R. Lerma) flows through it.

Chaparral, tn in Tolima dept, Colombia, 115 m. from Bogotá. It has agric. and forest products, and copper, iron, coal, and petroleum are found near by. It stands at an altitude of 2540 ft and has a pleasant climate. Near by are the painted rocks of Aipe and a peculiar grotto, Tuluni, the haunt of birds. Pop. 5500.

Chapayevsk (formerly Trotsk), tn in the Kuybyshev Oblast (Russia), 27 m. S.W. of Kuybyshev. It has agric. machinery and building materials industries. Pop. (1956) 78,000.

Chapbooks, or **Broadsides**, term believed to have come into use in the reign of George IV, and applied to small pamphlets as sold by chapmen, which at that time were the chief form of literature that the poor people enjoyed, not only in England but on the Continent. In Germany they were called *Volksbücher*, first printed in France for the populace after the invention of the printing press. The beginning of the 17th cent. is said to be about the time of their entry into England. Early in the 16th cent. some of these books were devoted to the interpretation of dreams, palmistry, astrology, etc., while others were such tales as *Jack the Giant Killer*, *Patient Grizel*, *Reynard the Fox*, etc. In Scotland a number of more or less religious books were in vogue, especially the 'prophecies' of Peden. Then humorous books were always favourites, among them being *The Merry Exploits of George Buchanan*. Thackeray describes the Irish C. in his *Irish Sketch Book*, chaps. xv, xvi.

Chapel, see FATHER OF THE CHAPEL.
Chapel (O.F. *chapele*, from Lat. *capella*, a sanctuary), a small building used for worship. C.s were attached to cathedrals, churches, and abbeys as early as the 10th cent., and were dedicated to some saint. An altar and relics of the saint were placed in the C., so that private devotions or special services might be held there. The central C. was often called the lady C. because it was dedicated to the Virgin Mary. C.s might also be erected to hold the tombs of private individuals, as Henry VII's C., added in 1502–20 to the E. end of Westminster Abbey. C.s were also built by private families on their

own estates, and by colleges and guilds. Modern colleges and schools frequently have C.s. The term C. is also applied to places of worship built by nonconformists, as distinct from those consecrated according to the laws of the Church of England (see also CHANTRY).

Chapel-en-le-Frith, tn and par. in Derbyshire, England, 6 m. N. of Buxton, formerly known as the 'capital of the Peak.' Pop. (tn) 4110; (par.) 6050.

Chapel Royal of England. The date of its foundation is not certain. It is known, however, that it existed at the time of Edward IV. Like the Ger. *Kapelle* it was understood not as a building but as a body of clergy and musicians. This original meaning has tended to fade out and to be replaced by its secondary interpretation as a royal chapel for the use of the sovereign and royal household.



CHAPEL ROYAL, ST JAMES'S PALACE

Appointments are now made to H.M. C.s R. Formerly it attended upon the sovereign wherever he or she might be, e.g. on Henry V at Agincourt and on Henry VIII at the Field of the Cloth of Gold. This practice is still followed on some occasions. There were 13 minstrels and 8 children in the C. R. of Edward IV; in the 15th cent. began the custom of the musical members performing 'interludes' before royalty, and, later, 'masques.' Under Elizabeth I it was specially distinguished for its music. 'The Chapel Royal, as an institution, has been of the greatest value . . . in promoting the development of English music' (Scholes). Among its famous organists were Tye, Byrd, and Gibbons, and, in the 17th cent., Purcell. Still later there were accomplished organists whose names are familiar to every student of Eng. church music. The standard of musical excellence is maintained. Its staff consists of a dean, sub-dean, 3 priests-in-ordinary, with 6 gentlemen and 10 children forming the choir, and a sergeant of the vestry. There are 36 chaplains to the sovereign with the

duty to preach a sermon when summoned, and an organist who is also choirmaster and composer at the C.s R. Services were held at Buckingham Palace until the destruction by bombing of the chapel there. Now the C. R. at St James's Palace and the Queen's Chapel, Marlborough Gate, are in use. The first of these is of Tudor origin; its ceiling, the design of which is generally attributed to Holbein, bears the date of 1540. The second was built for Charles I's queen by Inigo Jones. The public are admitted to the services.

The C. R. of Scotland was founded by Alexander I at Stirling Castle, but Mary had it removed to Holyrood. The chapel now consists of the dean, appointed by the sovereign, and 6 chaplains-in-ordinary who attend on the sovereign at Balmoral Castle. Any money that belongs to the chapel is given for salaries for chairs of divinity in connection with a univ. The name used to be given to Holyrood Abbey Church which is now in ruins.

Chaplain, Jean (1595-1674), Fr. poet and critic who first came into notice through his preface to the *Adone* of Marino in the year 1623. He was considered the chief of Fr. poets, and every one thought that his *Pucelle*, which was one of the pseudo-epics of that time, would equal the *Iliad* or *Aeneid*. The popularity of this work, however, did not endure, and after the praise bestowed on the issue of the first 12 cantos in 1656 had subsided, his fame gradually dwindled, and he was laughed at by the younger poets such as Boileau. Under the patronage of Richelieu, however, he was prominent in founding the Academy, and helped to formulate the rules of the 'three unities' in Fr. drama. His most important work is *Sentiments de l'Académie sur le Cid*, which he brought out in 1637. See G. Collas, *J. Chapelain*, 1912.

Chapelhall, vil. in Lanarkshire, Scotland, with collieries and light industries. Pop. 4000.

Chapelle (-St-Denis), La, dist. in the N. of Paris, an anct vil. joined to the city in 1860, and now a populous working-class area.

Chapelle Ardente, chamber, catafalque, or bier for the lying in state of exalted persons, lit with candles. In Westminster Abbey, at the Crossing, dead kings lay in effigy under elaborate canopies or 'hearses,' supporting a multitude of candles. The effigies, carried at the funerals, represented the actual corpse. Henry VII provided by his will that at his funeral a hearse should be set up, with 100 tapers and 4 great candles in the lantern space, until the king's great chapel was finished (see under WESTMINSTER ABBEY). The hearse of Edmund Crouchback (Earl of Lancaster) had no fewer than 559 candles, an odd number which suggests that there was a single one at the apex. This custom is first recorded as occurring at the obsequies of the Frankish king, Dagobert I, in the 7th cent. See W. R. Lethaby, *Westminster Abbey Re-examined*, 1925.

Chapeltown, large vill. of Yorks, England, in one of the pars. of Wortley (q.v.) rural dist., 6 m. from Sheffield, and giving its name to a ward sending representatives to Wortley Rural Dist. Council. Pop. 7000.

Chaperon (Fr. 'hood') has a variety of meanings: 1. It is the name often given to the plumes seen on horses' heads in funeral or other processions.

2. Also applied to the cap which is worn by members of the Eng. Order of the Garter.

3. The name given to the academic hood worn by all people who have taken a degree of any kind, such as Doctor of Music, Bachelor of Arts, etc.

4. Most commonly known as the term applied to a married lady who is acting as 'guardian' to an unmarried woman when appearing in public. This custom arose in the reign of Queen Anne. Prior to this no unmarried girl or woman could appear in public except under the guardianship of a near relation.

Chaplain, Jules Clément (1839-1909), sculptor of medals and busts, b. Mortagne, helped to revive the decayed art of engraving on medals. He executed a series for various societies and functions, including one for the Universal Exhibition of 1867, another in commemoration of the resistance of Paris, a third for the Salons, and a fourth to be given as a recognition of acts of heroism. Among his medallion portraits are those of Meissonier, Renan, Gambetta, Faure, and Loubet.

Chaplain, minister of religion attached to some private or official person, institution, or society. The name *chapelain*, Lat. *capellanus*, belonged originally to the priest in charge of the cloak (*cappa*) of St Martin of Tours (q.v.). This sacred relic was preserved in an oratory called the *capella* (whence 'chapel'). The title of C. gradually spread to all keepers of relics, and of such oratories, especially of the Chapel Royal, whose C. acquired great dignity and power by the time of Charlemagne. In England the sovereign has 36 Anglican C.s-in-ordinary who officiate in turn in the Chapels Royal, as well as honorary and domestic C.s. In Scotland Royal C.s are of the Church of Scotland (Presbyterian). C.s are also appointed by the Foreign Office to embassies and consulates abroad, and the Church of England (through various societies) maintains chaplaincies for Anglicans in most of the prin. cities of Europe. Anglican diocesan bishops have C.s who serve as private secretaries and attend them at religious functions; they also appoint examining C.s to test their ordinands. Anglican convents also have their C.s. In the Rom. Catholic Church there are chaplaincies endowed or maintained under lay or episcopal trusteeship for the performance of specific services, masses, etc. Parochial or auxiliary C.s may be appointed to assist in pars.; C.s (secular) are appointed by bishops to care for convents and communities; bishops also have their C.s at mass, and as private secretaries. Pope Pius X in 1907 gave his Pontifical C.s the title of Monsignore.

C.s of all denominations in the U.K. serve in prisons, hospitals, and in the armed forces. C.s of the Royal Navy are officers, but are not promoted to any specific non-spiritual rank, nor until the Second World War did they wear naval uniform. Every ship and estab. of a certain complement carries an Anglican C. selected, licensed by, and serving under the C. of the Fleet. C.s of other denominations are appointed to minister to their adherents on a capitation basis. Rom. Catholic C.s are controlled and appointed by the Senior Rom. Catholic C., with the approval of the Rom. Catholic Ordinary of the Forces, and the preliminary permission of the candidates' diocesan or religious superior. C.s of the Free Churches are appointed by and serve under their Senior C. (Methodist or United Board).

Army C.s, known as C.s to the Forces, serve under conditions laid down by the War Office. Anglican C.s serve under the C. General, and all C.s are officers and are promoted in definite rank within the C.s Dept.

C.s of the R.A.F. are granted the relative rank of flight lieutenant on appointment. Anglican C.s must have been 3 years in priest's orders, and be commended in writing by their bishop to C.-in-Chief, R.A.F. C.s of other ties (Rom. Catholic, Presbyterian, Methodist, United Board, Jewish) are selected on the recommendation of their respective governing bodies or eccles. superiors.

Though C.s are non-combatants they have shown notable valour and devotion to duty, as is indicated by the following figures for the R.N., the smallest in personnel of the 3 services, in the Second World War: total number of C.s serving, 653; killed in action, 18; d. on active service, 10; decorations, 44; mentions in dispatches, 17.

In the U.S. forces, until the National Defence Act, 1920, C.s, though always employed and recognised, had more liaison with the churches than with the military power. One aspect of their organisation is peculiarly American: within each branch of the service the supervisory C. may vary from one denomination to another. C.s carry the same rank as other officers, and are promoted in the same way. The high value and appreciation of C.s in the U.S. forces in the Second World War is shown by the fact that 1512 were decorated and 328 wounded. C.s had the third highest percentage of casualties of any officer corps or branch.

In France military and naval C.s were abolished on the separation of Church and State. Ministers of religion are subject to National Service, and perform their religious duties at the same time as their ordinary military functions.

Chaplin, Charles (1825-91), Fr. painter, b. Andelys (Eure) of Eng. parents. He soon found that his real vocation lay in painting portraits of women in the Watteau and Boucher style. He managed to catch the piquant charm of Parisian

women in his pictures. In 1860 he painted the apartments of the Empress Eugénie at the Louvre, and afterwards the bath-room at the Élysée. His best works are 'Les Bulles de Savon,' 'The Birth of Venus,' 'The Bath,' and 'Rising in the Morning.' He was also an excellent engraver, and made engravings of many of Decamp's and Watteau's pictures, and also of some of his own.

Chaplin, Charles Spencer ('Charlie Chaplin') (1889-), cinema actor, producer, and director, son of Charles C., a variety comedian. His boyhood home was in Kennington, S. London. He was on the stage from an early age, and in 1899 was appearing in music halls as one of the 'Eight Lancashire Lads.' He appeared at the opening of the London Hippodrome, 15 Jan. 1900, in *Giddy Ostend*; as Billy in Wm Gillette's version of *Sherlock Holmes*; as a wolf in the first production of *Peter Pan*, Duke of York's Theatre, 27 Dec. 1904; as Billy in *The Painful Predicament of Sherlock Holmes*, with Wm Gillette and Irene Vanbrugh, 3 Oct. 1905. Subsequently he joined Fred Karno's company, with whom he first appeared in the U.S.A., 1910. In 1913 he was engaged by Joseph Schenck for the Keystone company, for which he made his first film, *Making a Living*, 1914. Until 1940 he never deviated from the characteristic make-up and costume he introduced in his second film, *Kid Auto Races at Venice*, 1914. His little bowler hat, smudge moustache, slack trousers, and long-toed boots, his flat-footed gait and imperturbable impassivity, became so famous that by the end of the First World War he was the most widely recognised personality in the entire world. In 1919 C. was a co-founder with Griffith, Fairbanks, and Mary Pickford (qq.v.) of the United Artists Corporation. He lived for many years in the U.S.A., but now lives in Switzerland.

C.'s prin. films include: for Keystone 35 films, including *Tillie's Punctured Romance*, 1915. For Essanay 15 films, including *The Champion*, 1915, *The Tramp*, 1915, and *The Bank*, 1915. For Mutual 12 films, including *The Vagabond*, 1916, and *Easy Street*, 1917. For First National 9 films, including *A Dog's Life*, 1918, *Shoulder Arms*, 1918, *The Kid*, 1921, and *The Pilgrim*, 1923. Since 1923 C.'s films have been produced by himself: *A Woman in Paris*, 1923 (a serious film which C. directed, but in which he appeared only briefly), *The Gold Rush*, 1925, *The Circus*, 1928, *City Lights*, 1931, *Modern Times*, 1936, *The Great Dictator*, 1940, *Monsieur Verdoux*, 1947, and *Limelight*, 1952. In 1956 C. produced his first film in England, *A King in New York*.

Chaplin, Henry, 1st Viscount (1840-1923), statesman, educ. at Harrow and Christ Church, Oxford. He first entered Parliament in 1868 as a Conservative. He was also a well-known figure on the racecourse, and his horse Hermit won the Derby in 1867. In 1889 he became president of the new Board of Agriculture, with a seat in the Cabinet, and he kept this position till 1892. He was always

an advocate of Protection; and when Joseph Chamberlain began his Tariff Reform campaign, C. was one of its most ardent supporters. He was president of the Local Government Board, 1895-1900, and was responsible for the Agric. Rating Act. In 1916 he was raised to the peerage.

Chapman, George (c. 1559-1634), dramatist, poet, and translator, b. Hitchin, Herts. (Anthony Wood is responsible for the very dubious connection with Kent.) A fine classical scholar, he is said to have been educ. at Oxford, which he left for London about 1576. Here he settled at once to a literary career, was patronised by Sir Thomas Walsingham, Henry, Prince of Wales, and Carr, Earl of Somerset, and became friendly with Shakespeare (C. has been plausibly identified with Shakespeare's rival poet of the *Sonnets*), Spenser, Daniel, Marlowe, Jonson, and Inigo Jones, the architect, who after his death designed a monument for him in St Giles-in-the-Fields. His trans. of Homer, the earliest in England, appeared in various parts, the *Iliad*, 1598-1611, and the *Odyssey* 1614-16. These trans. occupied his leisure through much of his lifetime. His version of Homer is one of the most faithful to the original we possess in verse, his *Iliad* using the sonorous 14-syllabled rhyming line of Drayton's *Polyolbion*. It was warmly praised by Dryden, Pope, and Coleridge. His version of the *Odyssey* is in 10-syllabled heroic couplets and is hardly less deserving of the same high praise.

His first play was a comedy, *The Blind Beggar of Alexandria*, 1596, which, like its successor, *A Humorous Day's Mirth*, 1597, is poor. But his *All Fools*, 1605, is entertaining comedy, with ingenious situations, sprightly characters, and a well-constructed plot. *The Gentleman Usher*, 1606, and *Monsieur d'Oliver*, 1606, have some good features, but are defective in construction. *The Widdowes Tears*, 1612, is also among his better comedies. The comedy, *Eastward Hoe*, 1605, regarded as his best, was written in conjunction with Jonson and Marston and was the inspiration of Hogarth's 'Idle Apprentice.' Many of his tragedies are melodramas of bloodshed, with many horrors, no little rant and fustian, and deficient skill in characterisation. Among his tragedies are *Bussy d'Ambois*, 1607, *The Conspiracie*, and *Tragedie of Charles Duke of Byron*, 1608, *The Revenge of Bussy d'Ambois*, 1613, and *The Warres of Pompey and Caesar* (pub. 1631, but probably written much earlier). He also pub. sev. other trans. and various poetical works, including the euphuistic *Ovid's Banquet of Sense*, 1595, the continuation of Marlowe's *Hero and Leander*, 1598, *The Tears of Peace*, 1609, a dignified funeral song in memory of Prince Henry, 1612, and a masque performed by the societies of Lincoln's Inn and the Middle Temple to celebrate the betrothal of the Palgrave and the Princess Elizabeth in 1613. See T. M. Parrott, *Plays and Poems of George Chapman* (3 vols.),

1910-14; R. L. Hine, *Hitchin Worthies*, 1932; H. Ellis, *George Chapman*, 1934; P. Brooks Bartlett, *Poems of George Chapman*, 1942.

Chapman, John (1801-54), political writer, b. Loughborough, Leics. He failed in business, in 1834, and went to London and became ed. of the *Mechanics' Magazine*. He invented improvements in the 'four-wheeler,' which eventually led to the hansom cab.

Chapman, Sir Sydney John (1871-1951), economist, b. Wells, Norfolk. Educ. at Manchester Grammar School and Cambridge Univ. Prof. of political economy, Owens College, Manchester, 1901-17. Permanent under-secretary Board of Trade, 1920-7; chief economic adviser to the Brit Gov., 1927-32. Chairman of the Imperial Economic Committee, 1931-1932. Pub. *Outlines of Political Economy*, 1911.

Chapman, Walter, see CHEPMAN.

Chapman, small itinerant tradesman. In the 18th cent. he sold chapbooks, needles, laces, linen, and all sorts of things, and bought up old brass, old clothes, and sometimes human hair.

Chapone, Hester, *née* Mulso (1727-1801), essay writer, b. Twywell, Northants. She was an ardent admirer of Richardson the novelist. She wrote *Letters on the Improvement of the Mind* in 1773, which was very popular in girls' educational circles. Her complete writings may be found in vol. xviii of Chalmers's *British Essayists*, 1856-7.

Chappe, Claude (1763 - 1805), Fr. mechanician, b. Brillon, Normandy, the nephew of Abbé Chappe d'Auteroche, the astronomer. He was the inventor of a form of telegraphic communication founded on the theory of Robert Hooke (q.v.) (1684) as modified and practically demonstrated by Guillaume Amontons (q.v.), which he presented to the National Assembly in 1792. It was successfully tried between Paris and Lille, and soon came into general use.

Chappell, William (1582-1649), Bishop of Cork and Ross, b. Laxton, Notts. Archbishop Laud favoured him, and through his influence he was made dean of Cashel in 1633. Afterwards he was provost of Trinity College, Dublin, from 1637 to 1640, and became Bishop of Cork and Ross in 1638. After Strafford's fall, he was put into prison for a short time in Dublin in 1641 and at Tenby in 1642.

Chappell, William (1809-88), musical antiquary. He managed his father's business (a firm of piano-makers). He pub. *A Collection of National English Airs, consisting of Ancient Song, Ballad, and Dance Tunes*, in 2 vols., from 1838 to 1840, which he afterwards extended and reissued under the name of *Popular Music of the Olden Time*, 1855-9. In 1841 he founded the Musical Antiquarian Society as well as the Percy Society. For this latter society he ed. Dowland's songs, and assisted in the preparation of the *Percy Folio* in 1868. He also produced (1871-5) in 3 vols. his notes on the *Roxburghe Ballads*, of which only 1 vol.

was pub.; they contain a vast amount of antiquarian information.

Chaptal, Jean Antoine, Comte de Chanteloup (1756-1832), Fr. chemist and statesman, b. Nojaret, Lozère: graduated in medicine at Montpellier in 1777, and settled to scientific study in Paris. In 1781 he became prof. of chem. at Montpellier, and made many discoveries of considerable commercial value. Though in the main a supporter of the revolution, he was imprisoned by the popular party in 1793, but was soon released to become director of the saltpetre works at Grenelle. In 1796 he became a member of the Institute, in 1800 a councillor of state, in 1801 minister of the Interior, and in 1805 grand officer of the Légion d'Honneur, and a senator.

Chapter, originally an assembly of monks or canons, now usually the body of ecclesiastics, known as canons, attached to a cathedral or collegiate church. They are presided over by a dean, and are considered as the council of the bishop. The term is used in both the Anglican and Rom. Catholic churches.



THE NORMAN CHAPTER-HOUSE OF BRISTOL CATHEDRAL

An engraving of a drawing by H. Garland, 1838.

Chapter-house, building in which the canonical chapter (q.v.) of a monastery, cathedral, or collegiate church meets for the discussion of its affairs. They are often elaborately designed and ornamented, and usually polygonal, or octagonal, as at Lichfield and York, in shape. Benedictine C.s are usually square, as at Canterbury, but Westminster has an octagonal C. and Worcester a circular. The C. at Lincoln is a decagon. York C. is remarkable for still preserving the beautiful original stained-glass windows.

while the original frescoes are still to be seen on the walls at Westminster. At Ripon the usual central shaft is replaced by 2 central pillars supporting the ceiling, and there is an apsidal end. In position the C. usually lies to the W. of the transepts of the church, from which it opens either directly or by a passage. Crypts are occasionally found beneath the floor.

Chapu, Henri Michel Antoine (1833-91), Fr. sculptor. b. Mée, Seine-et-Marne, a pupil of both Pradier and Duret. He became a member of the Ecole des Beaux Arts in Paris in 1849 and won the Grand Prix, and in 1855 the medal. His first work shown in the Salon was 'Mercury inventing the Caduceus' (Luxembourg). His strong point in sculpture was his extremely able portrayal of tenderness and charm in woman. His most typical pieces of work are 'Princess Hélène at the Tomb of the duc d'Orléans', now at Dreux; and 'Youth' in memory of Henri Regnault. His 'Joan of Arc at Domrémy' in the Luxembourg is not his best work.

Chapultepec, castle and park $1\frac{1}{2}$ m. SW. of the centre of Mexico City, where the ancient Aztec kings resided. A castle was built on this site in the 13th cent. for Sp. viceroys; it was used by Maximilian, and later by Mexican presidents. It now serves as a national museum. Here the Mexicans were finally defeated by the Americans in 1847. In consequence Texas, New Mexico, and California were ceded to the U.S.A. The 1945 Inter-American Conference of Amer. Reps. was held here. C. Heights is a residential suburb of Mexico City adjoining the NW. of the park.

Char, see CHARR.

Char-à-banc was originally a large 4-wheeled vehicle in the form of a wagonette with benched seats from side to side and facing the driver. There was an alleyway in the middle. It was drawn by 2 or 4 horses according to size and used principally for picnic parties. It has in the motor age developed into the motor coach and the older meaning has fallen into disuse.

Characeae, family of the green Algae of which the species inhabit fresh and brackish water of pools and slow streams. They emit a nauseous offensive odour, and near Rome they are pestilential. They are interesting on account of the facility with which they exhibit the circulation of their fluids.

Characteristic, see LOGARITHM.

Charade, kind of riddle, consisting of the subdivision of a complete word, which forms the answer, into its component syllables or letters. A certain amount of information is given of each syllable or letter, and also of the reunited whole, which then has to be guessed. C.s may be either written or acted. In the latter, which form a favourite drawing-room amusement, the scenes—one for each syllable of the word, and one for the word itself—are arranged to introduce plainly, though not obtrusively, the syllable or word in question. C.s are usually extemporised, half the company retiring and

concocting scenes which they return and act to the remaining half, who attempt to guess the word. Written C.s for acting may also be bought. In dumb C.s the acting is entirely in dumb show.

Charadriiformes, plover-like birds, comprise sev. hundreds of species of various habits. The group is subdivided into 3 suborders: Charadrii (plovers, oystercatchers, snipe, woodcock, etc.), Lari (gulls, terns, skuas, etc.), and Alcae (auks, guillemots, razorbills, and puffins).

Charaeus, genus of moths of the owlet-moth family or Noctuidae, is represented in Britain by sev. species. The larvae feed upon roots and pupate underground. *C. graminis* is common in Sweden, where the caterpillar frequently proves destructive to the pastures.

Charalá, agric. tn of Santander dept, Colombia, 120 m. NE. of Bogotá. Pop. 2500.

Charcoal, blackish residue consisting of impure carbon, obtained by removing the volatile constituents of animal and vegetable substances. It is a porous solid, burning without flame or smoke, obtained by the imperfect combustion of organic matter. Various kinds are produced from wood, sugar, bone, and coal (giving coke and gas carbon). Wood charcoal results from strongly heating wood. If for fuel, it is best prepared by partial combustion of wood in heaps; for gunpowder the wood is charred in externally heated cylinders to avoid the introduction of grit. Brown C. used in preparing 'cocoa' powder, is prepared at a lower temp. Wood charcoal is used as a fuel, a filter, and an absorbent of gases and aqueous vapours; also as a non-conductor of heat, for packing round cold storage-rooms or refrigerators.

Animal C. or bone black, is produced by dry distillation of bones and ivory. It contains mainly calcium and magnesium phosphates, and is often manuf. from residues obtained in glue and gelatin industries. Its decolorising power was applied in 1812 to the clarification of syrups obtained in sugar refining, but other reagents have now replaced it for this purpose. It is also used as a deodorant and for artists' materials. See also CARBON.

Charcoal Burners. Men employed in the manuf. of wood charcoal could formerly be seen in large numbers in the woodland and forest dists. of Britain. Those in the New Forest who discovered the body of William Rufus in 1100 have passed into out-legendary hist. Charcoal burning on a large scale took place particularly in the Weald of Kent and Sussex where charcoal was used as fuel in the manuf. of iron. The change from charcoal fuel to coal, and subsequently coke, and the legislation against timber-felling were the chief reasons for the decline of the industry. Until the 17th cent. Sussex was the prin. source of Brit. iron. In the same areas charcoal was also burned for use in hop-drying and for the making of gunpowder, underwood being preferred for this purpose. The knowledge and practice of the 'colyers' was traditional,

their skill being handed down from family to family. A few such families still exist, each working its own hearths or pits. Former sites of pits can often be traced by field-names such as 'coalpit' or 'coldane.' The essence of the process is a carefully controlled slow combustion which continues for about 5 full days and nights, the burner staying close to his hearth the whole time. The logs and billets of wood are raised into a domed pile of considerable size, which is covered with earth, sand or turf. The centre is hollow to allow of firing and the subsequent cooling and putting-out. Draught is controlled by screens of sacking (usually old hop bags) and by turf-sealing. At the present day wood charcoal of quality is in demand for artists' materials, for the manuf. of absorbent medicinal biscuits, and for metallurgical processes. It is interesting to note that the primitive C. B. huts used in Sussex, Kent, and Essex until recent years differed little in form from those of Saxon days.

Charcot, Jean Baptiste Etienne Auguste (1867-1936), Fr. doctor and Antarctic explorer, b. Neuilly-sur-Seine, the son of Jean Martin C. He commanded the Fr. Antarctic expeditions of 1903-5 and 1908-10. The first expedition roughly charted the W. coast of Graham Land to Adelaide Is. The latter expedition sailed in the *Pourquoi Pas?*, then one of the best fitted-out vessels that ever put out on such a quest. The expedition brought back much valuable scientific information. More of the W. coast of Graham Land, including Adelaide Is., Alexander I Land, and Deception Is. were charted. Much hydrographic work was done, such as soundings, surface and deep-sea temps., deep-sea dredging and fishing with tow and vertical nets. Dr C. pub. an account of his explorations in *Le Français au Pôle Sud* in 1905, and *Le 'Pourquoi Pas?' dans l'Antarctique* in 1910 (C. Is. in Antarctica is named after him); *Rapports des croisières scientifiques de 1912 à 1914 et de 1919 à 1930*, and *Autour du Pôle Sud*, 1912. He d. at sea. See Marthe Oulie, *Charcot of the Antarctic*, 1938.

Charcot, Jean Martin (1825-93), Fr. physician, b. Paris, where he graduated M.D. in 1853. Three years later he became physician of the central hospitals bureau. In 1862 he was appointed physician to the Salpêtrière (a hospital for mental and nervous diseases). Here he created the greatest neurological clinic of modern times. A wonderful lecturer, he presented his cases in a most dramatic fashion on a small stage. He was a pioneer of psychotherapy, a great clinical observer and pathologist, and a talented artist, illustrating many of his case reports himself. He spent much time in the study of obscure morbid conditions; he also wrote on gout, diseases of the liver and kidney, etc. He became prof. of pathological anatomy, Paris Univ., in 1872, and prof. of neurology in 1883. His collected works appeared in 9 vols., 1888-1894. Axel Munthe, one of his pupils, has recorded many incidents at the Salpêtrière in *The Story of San Michele*;

see also G. Guillaín. *J. M. Charcot, sa vie et son œuvre*, 1955.

Chard, John Rouse Merriott (1847-97), engineer officer who defended Rorke's Drift successfully with Lt. Bromhead and 140 men against 3000 Zulus, on the night of the Isandhlwana disaster, 22 Jan. 1879.

Chard, municipal bor. and mrkt tn of Somerset, England, situated within a mile of the Devon border, on high ground, between the Bristol and Eng. Channels. It is of great historic interest, being the scene of a victory gained by the parl. forces during the Civil war. Judge Jeffreys held here in 1681 one of his 'bloody assizes.' There are manufs. of linen shirts and collars, lace, and iron and brass goods, also pencils and bearings. C. was the bp. of John Stringfellow, inventor of a heavier-than-air machine. Pop. 5260.

Chardin, Jean Baptiste Siméon (1699-1779), Fr. painter, b. Paris. He was a pupil of Coypel, whom he copied in details of nature. He became a member of the Académie Royale in 1728, in 1752 received a pension from the king, and was lodged in the Louvre from 1757. His early work was in still-life pictures, and they were often believed to be by Flem. artists. He was the first notable Fr. artist to depict middle-class life, which he did with truth and refinement. As a *genre* painter, he is in contrast with the court painters of his time who produced elegant artificialities, and is now admired as one of the greatest Fr. artists. Among his best paintings are 'Le Bénédicte', 'L'Enfant au Toton' ('Child with Teetotum'), 'Le Buffet', 'Le Jeune Violoniste', 'La Toilette du Matin', and 'Les Tours de Carte' ('Card Tricks'). Most of his pictures are in the Louvre. The National Gallery has 3, though the 'Still Life' formerly attributed to him is now pronounced to be by an imitator. Dublin has his 'Card Tricks.' See lives by E. and J. de Goncourt, 1864, E. Pilon, 1909, and G. Wildenstein, 1933.

Chardin, Sir John (1643-1713), Fr. traveller, b. Paris, the son of a jeweller. During 1664-70 he visited India and Persia, spending some years at Isfahan, where he acquired much useful knowledge, and was employed as a royal agent for the purchase of jewels. After revisiting Persia, he returned to Persia in 1671, remaining there till 1677. In 1681 he settled in London, where he was knighted by Charles II, elected a fellow of the Royal Society, and employed on diplomatic missions. His *Travels in Persia and the East Indies* (3 vols.) appeared 1686-1711.

Chardonnet Rayon, rayon yarn made from cotton waste. See RAYON.

Chardzhou: 1. Oblast (prov.) of the Turkmen S.S.R. of the Soviet Union. Some cotton is cultivated on the banks of the Amu Darya R., but the oblast is mainly given over to industry, particularly chemicals. Pop. 240,000.

2. Tn, cap. of oblast. A cotton and silk centre. Pop. 80,000.

Charente, dept of France, formed of the anct prov. of Angoumois, and parts of Saintonge, Poitou, Marche, Limousin, and

Guyenne. It is watered by the C., Vienne, and Dronne, the last forming the S. boundary. The surface is, in general, undulating, the dept being crossed by the low spurs of the Limousin, Guyenne, and Poitou Mts. There is considerable forest and heathland. The dept is predominantly agric., cereals, potatoes, beet, hemp, flax, and truffles being grown, but the most important product is the brandy made from grapes grown in the C. basin. There are metallurgical, chemical, paper, and textile manufs. The prin. tns are Angoulême (the cap.), Cognac, and Confolens (qq.v.). Area 2306 sq. m. Pop. 313,650.

Charente, River, riv. of France, rising in Haute-Vienne, 14 m. NW. of Chalus, and flowing W. through C. and C.-Maritime into the Atlantic opposite the is. of Oléron. Length 200 m. Tribs., Boutonne on the r. b., and Touvre and Né on the l. b.

Charente-Maritime, dept of SW. France, formed out of parts of the auct. provs. of Aunis, Saintonge, Poitou, and Angoumois, and including the is. of Ré and Oléron. It is watered by the Charente, Boutonne, Sèvre-Niortaise, Touvre, and Giroude. The countryside is extremely diverse. Cereals, vines, beet, potatoes, hemp, and fruit are grown, and much livestock is reared. There are pichard and oyster fisheries, and brandy, iron, chemical, and salt industries. The prin. tns are La Rochelle (the cap.), Jonzac, Rochefort, Saintes, and St-Jean-d'Angély (qq.v.). Area 2791 sq. m.; pop. 448,000.

Charenton-le-Pont, Fr. tn in the dept of Seine, a SE. suburb of Paris, at the confluence of the Seine and the Marne. In the 16th and 17th cents. C.-le-P. was a Huguenot centre. Its historic bridge has been rebuilt 17 times. In the part of C.-le-P. called St-Maurice is a celebrated lunatic asylum. The tn has mechanical and chemical manufs. and some boat-building. Pop. 21,000.

Chares, Athenian general of 4th cent. BC. In 366 he was sent to assist the Philiarians against the Argives, Arcadians, and Thebans; in 361 defeated the democratic party at Coreyra; in 358 compelled the execution of the Convention of Athenodorus in Thrace, and in 357 took over the command of the Social war. C. led the Athenians at Chaeronea (338).

Chares of Lindus, in Rhodes, Gk sculptor of about the 4th cent. BC, a pupil of Lysippus. He is the traditional designer of the Colossus at Rhodes, one of the 7 wonders of the world. See COLLOSSUS and APOLLO OF RHODES.

Chares of Mytilene, master of ceremonies at the court of Alexander the Great. He appears to have held sev. military commands, but in this connection he is sometimes confused with an Athenian officer of the same name who led his countrymen at Chaeronea. Small portions of C.'s book of anecdotes about Alexander are still extant.

Charrette de la Contrie, François Athanas (1763-98), a leader of the Vendean rebellion (in its latter stage) against the Fr. Revolution. He was b. at Couffé,

near Oudon (Loire-Inférieure). He took part in the unsuccessful attack on Nantes, 1793, and subsequently began a harassing guerrilla warfare. An armistice was made between C. and the Convention early in 1795, but it did not last long. After the defeat at Quiberon (1795) Hoche pursued him relentlessly, and defeated him again and again, finally taking him prisoner. C. was then executed at Nantes.

Charge, in law, in a wide sense denotes a duty or obligation imposed upon some person in a will, or deed, or contract, or in some transaction collateral thereto. More strictly C. denotes a mortgage, lien, hypothecation, or pledge over a specific thing by virtue of which a creditor may in certain events be entitled to satisfy his claim out of the thing itself or proceeds thereof.

Chargé d'Affaires, diplomatic agent, ranking next below a resident minister, and holding his credentials from the head of the foreign office. He may either act as a representative at a minor court or be empowered to take the place of an ambas. in his absence.

Charging Current: 1. Of an accumulator, see ACCUMULATOR.

2. Of a capacitor, the rate of flow of electricity required to establish a potential difference between the plates. The current at any instant is the (capacitance) \times (rate of change of the p.d.). See CIRCUIT, ELECTRIC.

Charing Cross, dist. of London, at the W. end of the Strand. It is generally regarded as the centre of London (i.e. the point from which distances are taken) and is so marked by a plaque N. of the statue of Charles I. The first part of the name derives probably from O.E. *cierring*, 'turning, turn,' referring either to the great bend of the Thames here or to the bend of the Roman road that ran W. from London. The second part of the name is due to the erection of a cross (1291), where now the statue of Charles I stands, to mark the last resting place of the coffin of Eleanor of Castile, queen of Edward I, before interment in Westminster Abbey. A modern copy stands in the courtyard of the station in the Strand.

Charing Cross Bridge Scheme, plan for giving greater traffic facilities, at the same time improving on the shortcomings of London in the matter of architectural beauty. The bridge over the Thames at Charing Cross is for railway traffic, with a footway beside the metals. It stands on the site of the old Hungerford suspension bridge; and the red-brick pier in the riv., near the Surrey side, forming part of the old bridge, has been incorporated in the present structure, which is of steel with round steel caissons, or pillars. While adequate for the purpose for which it was built, namely to carry the S. Region line into Charing Cross station, and admirable from the point of view of traffic on the riv., it has been denounced as an eyesore. Further, a road bridge at Charing Cross would greatly relieve the congested traffic in the Strand, and the existence of a tube railway under the Thames connecting Charing Cross with Waterloo has obviated

the necessity of a terminus on the Middx side of the riv. What finally brought the question to a head was the serious subsidence of 2 of the central arches of Waterloo Bridge (q.v.). The subsidence made the question of a new, or repaired, Waterloo Bridge urgent and the gov. of Mr Baldwin appointed a royal commission presided over by Lord Lee of Farnham to consider the whole question of the Thames bridges in London. This commission produced a report dealing, *inter alia*, with the Charing Cross scheme, and on 6 Mar. 1927 the gov. announced that

J. H. Forshaw and Sir Patrick Abercrombie in 1943, the erection of new bridges at Charing Cross and the Temple is regarded merely as a prerequisite of a proper development of the S. bank of the riv. It is suggested in this plan that the proposal for new bridges at Charing Cross and the Temple would be more than compensated for by the removal of 3 railway bridges and the substitution of tunnels. On the N. bank of the riv. the plan proposes that the riverside stations at Charing Cross, Cannon Street, and Blackfriars might be replaced by underground



HUNGERFORD BRIDGE, CHARING CROSS, FROM COUNTY HALL ON THE SURREY SIDE

it would find 50 to 75 per cent of the money needed for new bridges and riverside improvements in connection with them. On 30 July 1929 the London Co. Council and the shareholders of the S. railway approved the agreement reached between the leaders of these 2 bodies to build a new bridge from Charing Cross to the Surrey side, the scheme involving the placing of the terminus of the SE. section of the S. railway on the site of the Lion brewery. This approval having been given, a Bill was promoted in Parliament in 1930 to obtain the necessary sanction to proceed with this work. It was, however, rejected by the House of Commons, which was not satisfied with the site of the terminus and the effect it would have on the amenities of the Surrey bank. Two years later further preparation of the scheme lapsed for reasons of economy, the estimated cost being about £12,000,000.

In the elaborate Co. of London Plan prepared for the London Co. Council by

stations below their present sites and the 3 connected on an underground system to continue from Charing Cross to Victoria station and thence under the riv. to Battersea. The N. bank loop would be supplemented by a deep-level link from Charing Cross to London Bridge via Waterloo junction. By means of 2 underground loops it is hoped to dispense with the existing high-level approaches to Charing Cross and Cannon Street, as well as the existing high-level stations at London Bridge and Waterloo junction and their viaduct connections. All stations concerned would be replaced by underground 'through' stations on each loop. See J. H. Forshaw and Patrick Abercrombie, *County of London Plan*, 1943.

Chariot, kind of 2-wheeled carriage, used both in peace and war in ancient times by the Egyptians, Assyrians, Babylonians, Greeks, Romans, and Britons, etc. Various forms of C.s for different purposes

are depicted in monuments, etc. The most familiar type is the war C., usually drawn by 2 horses. That of the Homeric heroes is partly formed of open rail work; the Rom. pattern is rather heavier, and that of E. nations still more solid. Some peoples attached scythos to the wheel-axles of their war C.s. The quadriga, or racing C., was drawn by 4 horses harnessed abreast, as was also the Rom. *currus triumphalis*, on which generals made triumphant entries into Rome. This was round in shape and, unlike most C.s, closed behind.

Charisius Aurelius Arcadius, Rom. jurist of about the 4th cent. A.D. His works are quoted in the *Digest*, and from internal evidence he is supposed to be the last jurist of the classical period of Rom. jurisprudence. The 3 books of which portions remain are *Liber singularis de Testibus*; *Liber singularis de Muneribus civilibus*; and *Liber singularis de Officio Praefecti praetorio*.

Charité, La (-sur-Loire), Fr. in the dept of Nièvre. There are the ruins of an 11th-cent. priory, to which the tn owes its origin, and a magnificent 12-cent. church. There are wine and textile industries. Pop. 4300.

Charites (Lat. *Gratiae*). Graces, daughters of Zeus and goddesses of beauty and grace. Three in number, Aglaia (Brilliance), Euphrosyne (Mirth), and Thalia (Bloom), they attended Aphrodite. They presided over physical exercises, dancing, and festivals, and were the patrons of poetry and art, in close alliance with the Muses. They are generally represented as young, beautiful, naked, holding hands.

Charities (Charitable Trusts and Uses, Superstitious Uses). The term charity popularly connotes the relief of poverty. In Eng. law it has a wider meaning and has been judicially defined as a gift to the general public purpose so that it may benefit rich and poor alike. The preamble to a statute of Elizabeth I enumerated a long list of varied objects which the law regarded as 'charitable.' Although there is no comprehensive definition of a legal charity, the 4 types described by Lord Macnaughton in Commissioners of Inland Revenue v. Pemsel (1891) provide a reasonable test. He included 'trusts for the relief of poverty, for the advancement of education, for the advancement of religion, and trusts for other purposes beneficial to the community, not falling under any of the preceding heads.' In law C. and charitable uses and trusts are synonymous. A charity must be capable of benefiting a section of the community (e.g. the aged and infirm of a particular place, the foundation of a particular school). A trust for a particular individual would not be charitable and would fail, if it transgressed the rule against perpetuities (q.v.). A trust expressed to be for 'philanthropic or benevolent' purposes is not charitable, if it is not accompanied by an intent to benefit 'charitable' purposes. The practical advantages of a 'charitable' trust over other trusts include: (1) The rule

forbidding perpetuities does not apply, thereby permitting trust funds to be settled for an indefinite period. (2) Income from charitable trust funds is exempt from income tax. (3) Provided that the donor of the trust funds has expressed a paramount charitable intent, the charity will not fail for 'uncertainty of objects' (e.g. if a testator creates a trust for a hospital or school which ceases to exist, the funds will be applied to a similar object under a charity commissioners' scheme approved by the court—this is the doctrine of a *cy-près*). Attempts are often made by the next-of-kin to obtain declarations from the court that trusts do not satisfy the legal test of 'charity' and are therefore void; the effect of such declarations is that the trust funds either form part of the testator's residuary estate or pass to his next-of-kin as though he had died intestate (*see* INTERESTACY). When certain nonconformist sects suffered legal disabilities, trusts in their favour were declared void as 'superstitious uses.' Although the extension of religious toleration has now made such declarations rare, as recently as 1948 a gift to the Carmelite order for devotion to prayer was held to be void. Scots law contains no prohibition against donations in perpetuity for a public purpose or any distinction between charitable trusts and any other public trust. In Ireland the Charitable Donations and Bequests (Ireland) Acts, 1844, 1867, and 1871, allowed of bequests for saying masses either generally or to commemorate the named dead. As to the statutory inability of C. to hold lands, and the exceptions under the Mortmain Acts, *see* MORTMAIN.

Statutes governing charities. The law on C. is of great antiquity, but in former times charitable benefactions were administered in a casual unsystematic manner. Prohibition against alienation in mortmain dates from feudal times, the earlier statutes being directed against the growing accumulation of land by the religious houses, whereby the meane lords lost the incidents of tenure. Thus the famous statute *De Viris Religiosis*, passed in the reign of Edward I, prohibited the acquisition and retention of land in such manner as to deprive the king and his lords of their feudal dues. A succession of statutes followed, until what are known as the Mortmain and Charitable Uses Acts were evolved. The first serious attempt to encourage charitable benefactions and to protect the foundations administering C. dates from the statute 43 Eliz. I, c. 4, repealed by the Mortmain and Charitable Uses Act, 1888. The definition of the term charity, in so far as it is capable of legal definition, is to be found in the Mortmain and Charitable Uses Act, 1888 (section 13), preserving the preamble to the repealed statute of Elizabeth I. The Charities Procedure Act, 1812, popularly known as Romilly's Act, is the basis of the jurisdiction of the chancery div. of the high court to deal with charity matters on petition, and the forerunner of the Charitable Trusts Acts. The Charitable Trusts Acts, 1853-1939,

form the basis of modern charity administration; under these the charity commissioners, sitting as a board, exercise a controlling influence over charitable foundations (see CHARITY COMMISSIONERS). The Mortmain and Charitable Uses Act, 1888, consolidated the law relating to mortmain and the disposition of land for charitable uses. It did not apply, however, to testamentary dispositions; hence an amending Act was passed (1891) providing, *inter alia*, for devises of land for charitable uses; but required such land, notwithstanding anything in the will, to be sold within a year of the testator's death or such extended period as might be determined by the court or the charity commissioners, unless, being satisfied that the land is required for actual retention for the purposes of the charity, they allow it to be retained. There are a number of statutes relating to Rom. Catholic C. (see also MASS STIPENDS), war C., C. for the disabled, etc.

Some C. are cents. old and began before the introduction of public pensions and social services in the present cent. The Nathan Committee on C. has recently recommended amendments to the law which would permit trust funds to be applied more usefully and realistically. Up to 1956 no legislative reforms had been introduced. See Tudor's *Law of Charitable Trusts*, 1932, and Halsbury's *Laws of England*, title 'Charities.'

Chariton, Gk romance-writer of (probably) the 4th cent. AD, b. at Aphrodisias in Caria. His *Loves of Chaereas and Callirhoe*, some episodes of which are historical, is set in the time of the Peloponnesian war. Ed. R. Hercher, 1859.

Charity, Orders of, religious orders of men and women devoted to the service of the poor or afflicted. The earliest sisters of charity in the Rom. Catholic Church were founded by S. Vincent de Paul in Paris in 1633. Sisterhoods of charity were formed in the Anglican Church during the 19th cent. See also SISTERHOODS.

Charity Commissioners. The C. C. were estab. by the Charitable Trusts Act, 1853, for the better administration of endowments subject to charitable trusts (see CHARITIES). Their functions in this field were extended by amending Acts, and they have special functions under the Mortmain and Charitable Uses Acts, 1888-92, the War Charities Act, 1940, the National Assistance Act, 1948, and other Acts.

The Charitable Trusts Acts, 1853-1939, extend to every institution in England or Wales endowed for charitable purposes, subject to express exemptions, notably the univs. of Oxford, Cambridge, London, Durham, and others, Eton and Winchester Colleges, cathedral and collegiate churches, buildings registered and used as places of meeting for religious worship, the Brit. Museum, funds controlled by the Church Commissioners, friendly or benefit societies, and societies for religious or other charitable purposes wholly maintained by voluntary contributions.

The C. C. can remove and appoint

trustees of charities and advise trustees on the administration of charities, trustees who act on such advice being indemnified against all liability. The authority of the C. C. is normally needed to sell, mortgage, or grant leases of land held subject to a charitable trust. The C. C. can establish schemes for effectuating the charitable intentions of founders when altered conditions make performance impracticable. (See as to *cy-près* under CHARITIES.) Orders of the C. C. have the same effect as those of the high court. The C. C. have adequate powers of demanding accounts, inquiring into the condition and management of charities, supervising the expenditure of income, and controlling the disposition of capital funds by trustees.

The powers of the C. C. in regard to educational charities and certain quasi-educational charities are exercisable by the Minister of Education. Under the Act of 1853 an ann. report must be laid before Parliament, and must set forth such schemes approved by the C. C. as require enactment by Parliament. Since 1903 there have been 3 C. C., 2 being barristers-at-law of 12 years' standing and salaried, and the third a member of the House of Commons, from which paid commissioners are debarred. The Secretary of the C. C. is the Official Trustee of Charity Lands and certain officials of the C. C. are appointed the Official Trustees of Charitable Funds. In 1955 they held stocks and investments in trust for charities of a nominal value exceeding £128,000,000.

A Gov. White Paper presented in July 1955 proposed changes in the constitution and powers of the C. C. See works mentioned under CHARITIES and ann. reports of the commissioners.

Charity Organisation Society, see FAMILY WELFARE ASSOCIATION.

Charivari, Fr. term of uncertain origin, used for a wild uproar caused by the banging of pans and kettles, mingled with hissing, groaning, and shouting, expressive of disapproval of the people against whom it is directed. It was originally a regular wedding custom in France in the Middle Ages, but later it was only used at unpopular weddings, particularly for widows or widowers who remarried too soon. The violence and coarse nature of the C.s were strongly opposed by the Church, and in the 17th cent. the Council of Tours forbade them entirely under pain of excommunication. The custom still continues in some rural dists., and is similar to the 'Haberdreien' of the Bavarian peasants. It is still found in Spain, and a similar custom is common in primitive societies (e.g. the 'Drum-song' of the Eskimo). In modern times the name C., from its suggesting satire and derision, has been taken as the title of various satirical papers, e.g. the *Charivari* (Paris), 1832, and as a subtitle for the Eng. *Punch*.

Charlatan (It. *ciarlatano*, from *ciarlare*, to chatter), introduced in the 16th cent. as the name for a group of the *jongleurs* who amused the people by their 'patter' and buffooneries. The name quickly

became associated with cheap-jacks and quack doctors, hence it has come to be used of any impostor.

Charlemagne (*Carolus Magnus*), or **Charles I** (c. AD 742-814), son of Pépin le Bref, King of the Franks, and emperor of the W. On his father's death, 768, he became King of Austrasia and Neustria, and on the death of his brother Carloman, 771, added his dominions, becoming supreme ruler of the whole empire.

C. was an outstanding statesman, legislator, and soldier, and founder of the 'Holy Roman Empire.' His success was largely due to his championship of Christianity. His war against the Saxons lasted from 772 to 804, some of the chief incidents being the storming of Eresburg, and the May-field at Paderborn (777), and the submission of the Saxon leader, Wittekind. The result was the complete subjugation and Christianisation of the Saxons. C. divorced his first wife, daughter of Desiderius of Lombardy, and married a Ger. princess, Hildegard. (He married 4 times in all.) In 773 Pope Adrian I appealed to C. to crush Desiderius, and C. eagerly seized the chance to make himself King of Lombardy (774). In 778 he fought against the Arabs in Spain. On his return he met with a reverse at Roncesvalles, where Roland and other famous paladins were slain by the Saracens. Then he waged border wars against Lombards, Bavarians, Avars, Bretons, and others (c. 788-800). In 800 Pope Leo III crowned him at Rome as emperor of the W., with the title 'Caesar Augustus.' In 808-10 he defeated the Danes, driving them back behind the Elbe. To protect his kingdom he erected marks or margravates in the border dists. In 813 he associated his son, Louis le Débonnaire, with him in the gov. Louis was the only legitimate son who survived him, and became his successor. His empire at its height stretched between the Elbe and Ebro, reaching eastward to Hungary and S. to Calabria.

C. was a notable patron of music and learning, welcoming such scholars as Einhard and Alcuin to his court. Einhard's (q.v.) biography of C., a model of its kind, is largely responsible for the traditional picture of C. as a devout Christian, brilliant man of action, and inspired legislator. Though this is true it is also true that C. remained, in personal character, much of a barbarian, and that, in fact, neither the empire he created nor the culture he patronised survived his death intact. He had, however, a genuine sense of religious mission: and the picture of the traditional C., the protagonist of European unity, has had a profound influence on European hist. lasting to the present day. His descendants (and, loosely, his immediate forebears) are known as Carolingians (q.v.) forming the second dynasty of Fr. kings. See *Einhard's Vita Caroli Magni* (Eng. trans. A. G. Grant, 1905; H. W. Garrod, 1915). See also lives by T. Hodgkin, 1894; H. W. C. Davis, 1900; G. P. Baker, 1933; D. Woodruff, 1934; R. Winston, 1956.

Charlemont, anct Fr. fort, now in ruins, on a height of 700 ft by the R. Meuse, near the Belgian frontier, opposite Givet (q.v.). It was built by Charles V, and improved by Vauban (q.v.).

Charleroi, industrial tn in the prov. of Hainaut, Belgium, on R. Sambre, 30 m. S. of Brussels. It is the centre of a great coal-producing region, and stands at the junction of numerous railways which distribute the coal all over Belgium. There are large iron foundries, machine shops, factories of cutlery, glass, mails, electrical industries, fire-bricks, etc. The C. canal connects the tn with Brussels. Formerly a fortress. At the battle of C., which took place 22-3 Aug. 1914, the Fifth Fr. Army was overwhelmed by the Germans and forced to retreat. C. was taken and 160 houses were burnt. C. fell to the 3rd Armoured Div. of Hodges' Amer. First Army after a rapid advance of 40 m., 2-3 Sept. (1944) which carried them across the Belgian border. Pop. (1955) 26,100.

Charles I, King of the Franks, see **CHARLEMAGNE**.

Charles II, the Bald (823-77), Holy Rom. emperor and King of the W. Franks, son of Louis the Pious. The div. of the empire on the death of Louis the Pious was the cause of the outbreak of war between his sons. C. and Louis the German forced the Emperor Lothaire to make peace at Verdun, 843. On the death of Louis II C. received the crown of the empire, but Louis the German immediately invaded his kingdom and ravaged it.

Charles III, the Fat (832-88), King of the Franks and Emperor of the Romans. He was the youngest son of Louis the German, and received from his father the kingdom of Swabia. On the death of his 2 elder brothers he became sole king of the E. Franks (882) and was also crowned Holy Rom. Emperor. Two years later he became King of the W. Franks. But he found it impossible to hold his kingdom together. His attempt to drive out the Saracens from Italy failed entirely, and he was only able to obtain terms with the Norsemen—who penetrated at this time as far as Paris, which they besieged—by heavy payments. He was deposed in 887.

Charles IV (1316-78), emperor of the Holy Rom. Empire and King of Bohemia. He was educ. in France and married the sister of the Fr. king, Philip VI. He was chosen as the Ger. candidate for the empire in opposition to Louis IV, who had quarrelled with the papacy. He took part with his father in the battle of Crécy. He succeeded Louis IV as emperor in 1347, and was crowned in Rome in 1355. His main interest was in Bohemia, however, where he did much to promote culture and commerce. He founded Prague Univ. See life by B. Jarrett, 1935.

Charles V (1500-58), emperor of the Holy Rom. Empire and King of Spain (as Charles I). He was the son of Philip of Burgundy and Joanna (Juana), the daughter of Ferdinand and Isabella, and was b. at Ghent. Six years later his

father *d.*, and C. succeeded to the Netherlands and the *Franchie Comté*. In 1516 Ferdinand *d.*, and C. was recognised as the sovereign of Castile and Aragon in 1518, his mother being insane. In 1519 he succeeded to the Hapsburg possessions on the death of his paternal grandfather, Maximilian, and, in spite of considerable opposition on the part of France and the papacy, he was elected emperor and crowned (1520). C.'s dominions were very widespread; he ruled Spain and the Americas, parts of Italy (Naples, Sicily, and Sardinia), together with the Hapsburg possessions, which were themselves a scattered collection of different races. He was hampered in Spain by the Cortes, in Germany by the Diets, and there was in almost every different part of his empire a different system of gov. The difficulties of the beginning of his reign can be shortly stated as coming (1) from Lutheranism, a force with which he was confronted right from the beginning of the reign, and with which, though he himself was personally opposed to its dogmas, he was, for political reasons consistently and sincerely to seek to compromise; (2) from the opposition of France, whose armies he had to fight in the first few years of his reign in order to keep possession of his It. dominions; (3) from the continually increasing Turkish power in Europe, which was made more formidable by its alliance with the piratical races of the N. of Africa. These difficulties were only solved transitorily by C., and were constantly recurring.

At the Diet of Worms in 1521, presided over by C., Luther and Lutheranism were condemned; but the condemnation never had any practical force and was cancelled by the Diet of Spire. The early part of C.'s reign is most notable for the struggle with Francis I of France, a struggle which ended only with the defeat and capture of Francis at Pavia. C.'s successes in Italy antagonised the papacy; but in 1527 an army of the emperor, gathered from almost every part of his wide empire, attacked, captured, and sacked Rome, making the Pope a prisoner. C. immediately disclaimed all responsibility for the act, but made full use of the political advantages which it gave him. In 1529 Francis and C. made peace at Cambrai, C. receiving Lombardy from France, and in the following year was held the Diet of Augsburg, which reiterated the decisions of the Diet of Worms, and this brought about the formation of the 'Protestant' League of Schmalkald. But the persecution of the Protestants implied in the decisions at Augsburg was stayed by political events. Whilst C. was emperor, he would always be dependent upon the goodwill of his Protestant subjects for aid against the natural enemies of the empire. This time the difficulty arose in the E. The Turks were again threatening the E. border, but the danger was avoided without war, and C. returned to Spain. In 1535 he stormed and captured the pirate stronghold of Tunis. In 1539 C. commenced his policy of crushing the power of the prov. Cortes of Spain, which from this time gradually

sank into disrepute, and in the same year he crushed a rising in the Netherlands, depriving the *tn* of Ghent of all its privileges. In 1541 he again attempted to attack Tunis, but was unsuccessful, attributing his lack of success to an 'act of God.' War again broke out with Francis, who this time allied with the Turks, and Europe was horrified when the Turkish fleet anchored and wintered in Toulon. C. invaded France, imposing the treaty of Crépy (1544), when the Fr. claims on Italy were again repudiated. C. was now free to carry out the policy upon which he had set his heart, namely the subjugation of the Ger. princes to the imperial authority. Helped by the Protestant Maurice of Saxony (q.v.) C. crushed the Schmalkaldic League at Mühlberg (1547), and consequently imposed reforms which considerably increased the imperial authority. But in 1551 Maurice turned on C., and at Passau (1552) C. had to abandon the political gains made after Mühlberg, and the religious peace of Augsburg (1555) recognised the legality of Protestantism by establishing the principle of '*cuius regio, eius religio*.' In the same year C. resigned the Netherlands, the most dearly loved of all his possessions, to his son Philip, in the following year he resigned the Sp. possessions, and in 1558 he formally resigned the empire, although his brother Ferdinand had been emperor in all but name since 1555. He spent the remaining 3 years of his life in retirement at Yuste in the valley of Estremadura, where he d. in Sept. 1558. C.'s prin. aim was the preservation of the medieval ideal of the empire; this explains his subjugation—or attempted subjugation—of separatist movements, whether religious or political throughout his dominions, during his reign. Extremely conscientious, but utterly lacking in imagination, he never saw the impossibility of his task: he was seeking to preserve something which no longer existed, and which indeed had never existed in the ideal form in which he saw it; and his failure was inevitable. Personally neither fanatically religious nor politically savagely reactionary, it remains true that the religious and political persecutions and repression resultant in his attempts at centralisation were at least partially responsible for the difficulties of his successors. See lives by E. Armstrong, 1902, D. B. Wyndham Lewis, 1932, C. Brandi (trans. by C. V. Wedgwood), 1939, and R. Tyler, 1956.

Charles VI (1685–1740), Holy Rom. Emperor, second son of Leopold I, was b. at Vienna. When the extinction of the Sp. Hapsburg house became apparent, he was put forward as the Austrian claimant to the Sp. inheritance. By the second Partition Treaty he was to be recognised as the King of Spain, but on the death of Charles II of Spain Louis XIV abrogated the Partition Treaties. He was, however, proclaimed by the allies as King of Spain, and went to Spain in the early stages of the War of the Sp. Succession. He remained until 1711, having little success, although supported by the Catalans, and even entering Madrid. But he was never

popular with the Sp. people, and in 1711 virtually forfeited his claim when he became emperor. He ultimately abandoned Spain (treaty of Utrecht, 1714) and turned his attention to securing the succession to the Austrian throne for his daughter, Maria Theresa. He foresaw the struggle which must arise on his death without male heirs, and he sacrificed much in order to get the Pragmatic Sanction recognised by the powers, though in fact it was ignored after his death. During his reign the war with the Turks was brought to a successful issue by the treaty of Passarowitz, but before the end of his reign he had lost almost all that he gained by it.

Charles VII (1697-1745), Holy Rom. Emperor, elector of Bavaria, the son of the elector of Bavaria. He succeeded to the electorate in 1736, and his reign was taken up (in spite of having recognised the Pragmatic Sanction) in plotting to obtain the imperial crown on the death of Charles VI, uncle of his wife Maria Amelia. In 1740 he claimed the imperial crown and was put forward as the puppet of the anti-Austrian faction. He was crowned in 1742, but his sovereignty was merely nominal. His hereditary dominions were overrun by armies of both sides, and he d., worn out by his illnesses and troubles.

Charles III, the Simple (879-929), King of France, the posthumous son of Louis the Stammerer. In 893 he was recognised by a section of the nobility as king, and was crowned at Rheims. He forced the *de facto* king, Odo, to cede him Neustria, and ultimately, on the death of Odo, he became King of all France. C. ceded Normandy to the Norse leader Rollo, and thus estab. the future duchy of Normandy. The growth of the power of the king, however, roused the jealousy of the nobles, who made a conspiracy against him and placed Robert, Odo's brother, on the throne. The Robertians were later defeated, but C. himself was captured and imprisoned (922). He d. at Péronne.

Charles IV, the Fair (1294-1328), King of France, last of the direct Capetian line, succeeded his brother, Phillip V, in 1322. He tried to continue the policy of augmenting the power of the crown at the expense of the nobility, but in order to obtain money he resorted to dubious methods, such, for example, as the confiscation of the property of the Lombard merchants. He helped his sister Isabella in arranging the plot which finally overthrew Edward II.

Charles V (1337-80), King of France, sometimes called C. the Wise, b. at Vincennes. He was the son of John II, and narrowly escaped the fate of his father at the battle of Poitiers. During the imprisonment of John in England he acted as ruler of the country. The beginning of the Hundred Years War with England had brought many difficulties to the Fr. monarchy; the nobility's power had increased; the merchant classes had seized their opportunity to compel the ruler to make reforms; and in 1358 the Jacquerie (q.v.) added to the difficulties of the Crown. C.'s greatest struggle

during the regency was with the King of Navarre (Charles the Bad), whom he ultimately managed to subdue. The treaty of Brétigny brought the return of John, who, however, was unable to raise his ransom, and returned to England, where he d. in 1364. C. with the help of Bertrand du Guesclin (q.v.) now tried to put down the most formidable of his foes and to get rid of the free companies that were ravaging the country. War was renewed with the English in 1369 and C. was successful in winning it after it until by 1380 only a few towns remained in Eng. hands. In 1378 he made a premature attempt to annex the duchy of Brittany to the Fr. Crown, and his attempt brought in its train a national rising. Before a settlement was made C. died. C. owed his successes largely to his well-chosen advisers and administrators. His extravagances further increased the misery of an already impoverished people, however. He collected a large library of works on astrology, law, and philosophy, at the Louvre, which eventually formed the nucleus of the *Bibliothèque Royale*.

Charles VI (1368-1422), King of France, son of Charles V and the first of the Fr. princes to bear the title of Dauphin (q.v.) from birth. He succeeded to the throne at the age of 12, and during his minority France was governed by the dukes of Berry, Bourbon, Burgundy, and Anjou. The excesses of the regents resulted in serious rebellions in the towns of both N. and S. France, which were encouraged by the English, and which were only suppressed with difficulty. In 1388 C. asserted his authority by driving from power the royal dukes and appointing ministers of his own, who, because of their humble origin, were called the *marmousets*. But, though the first few years of his personal rule showed some promise, his mental instability became increasingly obvious. The royal dukes regained their power in France, and the struggle began between the Burgundians and the Orleansists. Matters were brought to a head by the murder of Orleans in 1407. The Burgundians for the time held the upper hand, and in league with the Parisians forced the king to do their will. In 1413 the Orleansists entered Paris and drove the Burgundians into the arms of England, with whom they concluded an alliance. Henry V (q.v.) again put forward the Eng. claim to the Fr. crown and invaded France. In 1415 Agincourt was fought, and in 1418 Paris was captured by the Burgundians. In the following year John the Fearless was assassinated, and the Burgundians definitely became the allies of the English. In 1420 the treaty of Troyes, followed by the marriage of Henry V to the daughter of C. took place, and Henry became practically master of France, C. by now being quite incapable of ruling. See Froissart's *Chronicles*, and F. Funck-Brentano, *Le Moyen Age*, 1922.

Charles VII (1403-61), King of France, son of Charles VI, became lieutenant-general of the kingdom in 1417. His power and authority, however, sank after

the murder of John the Fearless in 1419, and by the treaty of Troyes he was passed over in the succession to the crown, his legitimacy being disputed. He retired to Mehun, near Bourges. On his father's death he was recognised as King of France by the S. provs., but he gradually lost all hold on the N., and the victories of the English during the early part of his reign lost him still more power. The central provs. of France were involved in internal civil struggles, and C. seems to have considered his cause quite hopeless until Joan of Arc (q.v.) appeared, and led him to success after success. Orleans was captured, and he was crowned at Rheims. In 1435 the Duke of Burgundy joined forces with C. in driving out the English. The English were gradually driven out of their Fr. possessions until by 1453 they retained only Calais. Though notorious for his indolence and indifferent leadership in his youth, C. later showed considerable drive in asserting the royal authority in France; and at his death the worst of the anarchy of the past cent. had been suppressed. See life by F. de Beaucourt, 1891.

Charles VIII (1470-98), King of France, the only son of Louis XI. He succeeded his father in 1483 and although he was declared capable of ruling he left the gov. of the country in the hands of his sister, Anne of Beaujeu. He married in 1491 the Duchess of Brittany, thus uniting the last independent duchy in France to the monarchy. In 1492 he took over the gov. for himself. Ambitious and romantic, he decided to attempt to obtain the kingdom of Naples, to reconquer the E. empire, and to become its emperor. To obtain this desire he sacrificed everything; he entered Naples in 1495, but was unable to proceed any further with this plan since a coalition of the powers was formed against him. He was forced to return to France, and here, whilst preparing for a second expedition, he died. The second part of Comines' *Memoires* give a full contemporary account of C.'s reign.

Charles IX (1550-74), King of France, son of Henry II and Catherine de' Medici. He succeeded to the throne at the age of 10, and the effective gov. was exercised by his mother. C. appears to have been a moral degenerate, but he was not without intelligence or occasional sensitivity. He married in 1570 Elizabeth of Austria. His patronage of Coligny, after 1570, aroused his mother's acute jealousy, and she finally seems to have cajoled her son into agreeing to the Huguenot leader's assassination. This led directly to the indiscriminate massacre of Fr. Protestants on St Bartholomew's Day, 24 Aug. 1572, which Catherine and her son almost certainly never anticipated. C. was already broken in health, but the massacre preyed on his mind and he d. prematurely aged and mentally sick. See L. Romier, *Catholiques et Huguenots à la cour de Charles IX*, 1924.

Charles X (1757-1836), King of France, younger brother of Louis XVI and Louis XVIII, b. Versailles. Before his accession

to the throne he was known as the Comte d'Artois. He became the leader of the ultra-Royalists on the outbreak of the Fr. Revolution, and in 1789 he left France to become the leader of the Emigrés. He visited many of the courts of Europe, trying to obtain help for the Royalist party. In 1795 he landed in France to put himself at the head of the rising of La Vendée, but he soon retired, leaving the



Hanfstäengl

CHARLES IX OF FRANCE

From the painting by François Clouet.

Royalists of the W. totally unsupported. He lived for the rest of his exile chiefly at Holyrood Palace. In 1814 he returned to France, and during the reign of his brother, Louis XVIII, he led the ultra-Royalist faction. He succeeded his brother in 1824, and his reactionary measures soon made him exceedingly unpopular. In 1825 he was openly insulted in the streets. He had no intention of becoming a constitutional monarch, and although he was compelled to get rid of his unpopular minister Villèle, he still showed no signs of giving up his absolutist pretensions. In 1830, the elections having gone against him and finding violent opposition in the Chamber of Deputies, he suspended the constitution. The result was the outbreak of a revolution which C. at first did not treat seriously. But he retired from Paris, and when the seriousness of the situation was evident, he abdicated in favour of his grandson, Louis Philippe, Duke of Orleans, however, was chosen king, and C. retired to England. He d. at Gorizia where he had gone for health reasons. See P. Vedrenne, *Vie de Charles X*, 1879; J. M. S. Allison, *Thiers and the*

French Monarchy, 1926; J. Lucas-Dubreton, *Le Comte d'Artois, Charles X*, 1927.

Charles VII (d. 1167), King of Sweden from 1160. He helped to establish Christianity in Sweden and created the archbishopric of Uppsala, 1164.

Charles VIII (d. 1470), first elected King of Sweden in 1436, when the Swedes broke away from Denmark and Norway. His name was originally Karl Knutsson Bende. He was forced to retire before Christopher of Bavaria in 1441, but after the death of the latter prince was restored, 1449. He was subsequently forced into exile on 2 more occasions. After his death the 3 kingdoms of Scandinavia were again united.

Charles IX (1550-1611), King of Sweden, third and youngest son of Gustavus Vasa; he is remembered for his fervent Protestantism, and his struggles in order to obtain the recognition of Sweden as a Protestant nation. In 1568 he was the leader of the rebellion against Eric XIV, and he was involved in struggles with John III during the greater part of John's reign. When Sigismund, a Catholic, and already King of Poland, succeeded to the Swedish throne in 1592, C. came forward as the champion of Protestantism. He was appointed regent in 1595, and in 1600 Sigismund was deposed. C. assumed the title of king in 1604, but was not actually crowned until 1607. Lutheranism was then made the estab. religion of Sweden. His foreign policy involved him in wars with Russia and Denmark, which were not successful.

Charles X (1622-60), King of Sweden, and nephew of Gustavus Adolphus. He is important solely as a great warrior king, and took part in the later campaign of the Thirty Years War. He was the recognised heir to the Swedish throne, to which he succeeded on the abdication of Christina in 1654. In 1655 he determined upon war with Poland, and called the Riksdag to grant him supplies. He gathered together a great army and navy and attacked the Poles. Warsaw was easily won, and after a long siege Cracow fell too, and Poland appeared to be conquered, but the Poles then rose against C. in a war of national liberation. C. was forced to buy the support of the elector of Brandenburg at the price of Prussian independence, and in the following year the Danes too declared war against him. C. gave up the Polish campaign and concentrated on Denmark. He attacked from the S., but his most astounding feats were the crossing of the Little and Great Belts with his army over the ice. The effect of his unique movement was to crush the Danes who immediately opened negotiations for peace (1658) and agreed to the cession of large tracts of ter. In 1660, when he was meditating an attack upon Norway, and had crossed to Sweden to persuade the Riksdag to grant him further supplies, he d. worn out probably with the strenuous life he had led. While he brought great military glory to Sweden, the effect of his wars was fundamentally to exhaust the country.

Charles XI (1655-97), King of Sweden, succeeded to the throne at the age of 4, being the only son of Charles X. His effective rule began in 1672, the country having been generally neglected during the preceding regency. The Danes soon seized the chance to attack what appeared to be a declining Sweden; but C. soon showed he had the courage and military genius of his predecessors. He defeated the Danes at Fyllebro in 1676 and in the same year he again defeated Christian V of Denmark in the great battle at Lund. The latter battle was bitterly contested, and although the losses of the Swedes were great, their eventual victory practically annihilated the forces of Denmark. In 1678 he again defeated the Danes at the battle of Malmö, and in the following years consented to a peace dictated by Louis XIV. The rest of his reign was devoted to the estab. of Sweden upon a sound basis, and to the rectification of her financial position. Practically every side of the administration was overhauled, the finances were reformed, commerce encouraged, and church gov. and education improved. C. was one of Sweden's wisest kings, combining the military talent of the Vasas with an appreciation of the pressing domestic needs of his country.

Charles XII (1682-1718), King of Sweden, the only surviving son of Charles XI. At an early age he showed considerable natural ability. He was a good rider, a good marksman, and excelled in mathematics and languages. He was also carefully trained in matters of administration, and at an early age was instructed by his father in all affairs of state. He succeeded in 1697, and was given the full sovereignty at once. The great N. war of 1699 in which Russia, Poland, and Denmark allied in an attempt to crush what they assumed to be a weak Sweden, under a king who was little more than a boy, forced C. into the military career in which he was to show himself so outstanding. He first defeated the Danes, forcing them to a humiliating peace at Travendal (1700), and then marched against the Russians who were besieging Narva, and after a week of forced marches succeeded in defeating the besieging force with only small loss to himself. He now turned to pursue the enemy he hated most, Augustus of Saxony, King of Poland. He captured Warsaw and marched against Cracow, defeating the Poles and Saxons at Klissow. In 1703 C. won the battle of Pultusk, and later another battle at Menitz. He deposed Augustus (1704), and set up a candidate who was crowned in 1705. In Sept. 1707 he forced Augustus to sign a treaty by which he permanently resigned his claims to the Polish crown and his hostility to Sweden. He now marched against Russia, defeated her at Holowczyn, and as the Russians fell back followed slowly towards Moscow. Realising too late he could not reach Moscow, he now marched southward to join the hetman of the Cossacks, Mazepa. The Czar had already destroyed Mazepa's conspiracy, and when the hetman joined C. it was as a fugitive. The winter of 1708

was one of the most severe Europe had known for 100 years and the unprepared Swedish Army suffered terribly. Finally, when the frost broke and the Russians were attacked, the Swedes were practically annihilated at Poltava (1709), and C. with the remnant of his army took refuge in Turkey, trying to persuade the Turks to embark on a major war with Russia. Eventually, realising that Sweden herself was again in danger, he arrived in Stralsund in Nov. 1714. C. immediately raised an army which was strong enough to prevent his being attacked by his enemies, and in 1717 he began an attack on Norway. But in the following year, while leading an expedition to Norway, he was shot in the trenches whilst besieging Fredriksten. C. was a brilliant soldier and a born leader, able to inspire his men in victory and defeat, as is shown in his disastrous Russian campaign; but his lust for military conquest was insatiable, and rather than accept offers of peace he preferred to fight on even when the odds had become unrealistically heavy against him. His constant wars brought Sweden to the verge of internal collapse. One of the most interesting lives is still Voltaire's *Histoire de Charles XII*, 1731. See also lives by R. N. Bain, 1896, and E. Godley, 1928.

Charles XIII (1748-1818), King of Sweden, second son of Frederick Adolphus, b. Stockholm. He distinguished himself as an admiral in the Russo-Swedish war, and was regent of the country (1792-6). In 1809 he was elected king in place of the deposed Gustavus IV. In 1810 Bernadotte (Charles XIV, q.v.) was elected crown prince and practically took all power out of the hands of the king, who had by this time become decrepit. In 1814 he became the first king of a united Norway and Sweden, and in 1818 he died, having for 10 years been king only in name.

Charles XIV (1763-1844), King of Sweden and Norway, known also as Jean Baptiste Jules Bernadotte; the son of a lawyer at Pau. He was b. at Pau and entered the Fr. Army in 1780, soon showing considerable ability. On the outbreak of the revolution he received speedy promotion. He was at the battle of Fleurus and took part in the campaigns in Germany. In 1797 he took reinforcements to Napoleon in Italy, and in the following year he became ambas. in Vienna. In the same year by his marriage to Désirée Clary he became the brother-in-law of Joseph Bonaparte. He did not take an active part in the *coup d'état* by which Napoleon became First Consul, but he was given in 1801 the command of the army in La Vendée. In 1804, when the empire was declared, he was made a marshal of France, and was also appointed Governor of Hanover. He took part in the campaigns of Ulm and Austerlitz, and was later made governor of the Hanse towns. For his conduct at Austerlitz he was created Prince of Pontecorvo in 1805. After the battle of Jena he pursued the Prussians to Halle and Gen. Blücher to Lübeck, driving him into surrender. In

1810 he was appointed to command in the Netherlands. In the same year he was elected Crown Prince of Sweden. In Nov. he went to Sweden, where he was adopted by the king, Charles XIII, under the name of Charles John. He became exceedingly popular and was soon the effective ruler of the country. He took part in the later Ger. campaign against Napoleon, and in 1818 he succeeded his adopted father, Charles XIII, with the title of Charles XIV. His policy from the beginning had been to bring about a union with Norway, and in this he was (1814) successful. His reign on the whole was one of development and peace, and he proved himself an enlightened monarch. See Sir D. P. Barton, *Bernadotte and Napoleon*, 1921, and *The Amazing Career of Bernadotte*, 1929.

Charles XV (1826-72), King of Sweden and Norway. He was the eldest son of Oscar I, and succeeded to the throne in 1859. He was a popular and enlightened king, and during his reign a number of great reforms took place. The laws of the Church and the criminal laws underwent considerable revision, and the king gave his whole-hearted support to the laws which reformed the constitution (1866). He himself had considerable artistic ability.

Charles I (1226-85), King of Naples and Sicily, Count of Anjou, and seventh son of Louis VIII of France. He was b. before the accession of his brother, Louis IX, and was later, on the decease of another brother, given the cos. of Anjou and Maine. In 1245 he married the heiress of Provence. He accompanied St Louis on his first crusade, and was with him when he was defeated and captured, he himself sharing the same fate. Ransomed and released before the king, he returned to France to intrigue with the Countess of Flanders against the emperor. In 1257 he captured the important town of Marseilles and began to make his influence felt in N. Italy. His great opportunity came when the Pope decided to break down the power of the Hohenstaufen in Italy. He was offered the crown of Naples and Sicily, for which he was to pay a yearly tribute to the Pope, and which also he would have to win from their allegiance to Manfred, the natural son of Frederick II. He finally accepted the papal offer, and dispatched an expedition to Italy in 1264. In the following year he was crowned King of the Two Sicilies, and a year later he defeated and killed Manfred at Benevento. In 1268 a battle was fought at Tagliacozzo with Conradin, the last descendant of Frederick II, which resulted in the defeat of the supporters of the Hohenstaufen and the capture and execution of Conradin. C. was recognised as one of the most powerful monarchs in Europe, and his power was the greater owing to his influence over the papacy. In 1270 he took part in the second and ill-fated crusade of Louis IX, after whose death he returned to Italy. In 1282 occurred the massacre and expulsion known as the Sicilian Vespers, inspired by the cruelty and misrule of the French.

C. determined to avenge this disaster. After 2 defeats he was preparing another attempt from Naples when he d.

Charles I (1600-49), King of Great Britain and Ireland, the second son of James I and his wife Anne of Denmark, b. at Dunfermline. He was created Duke of Albany on his birth, Duke of York in 1605, and 4 years after the death of his elder brother he received the title of Prince of Wales (1616). From about 1620 C. fell under the influence of Buckingham, his father's favourite, whose vivacity was in strong contrast with C.'s own slow, serious nature. In 1623 he went to Spain



Reproduced by courtesy of the Trustees, the National Gallery, London

CHARLES I

Detail from oil-painting by Van Dyck.

in disguise with Buckingham in an ill-judged attempt to win the Infanta's love by this romantic adventure. Buckingham and C. returned home, their mission unsuccessful, loudly denouncing the ill faith of the Spaniards and calling for war, and in 1624 Parliament voted supplies for war with Spain. In 1625, the year in which he became king, C. married Henrietta Maria of France, a Catholic, who, after Buckingham's death, exercised a great and generally unhealthy influence on him in political matters. From 1625 to 1629 C. was engaged in a constant struggle with Parliament, where his religious and fiscal policies met with increasing opposition. In 1628 his third Parliament met and passed the Petition of Right, which forbade taxation without consent of Parliament, and arbitrary and illegal imprisonment. C. signed this under pressure, but probably never considered it binding, in view of his theory of the divine right of kings; and the defection of Wentworth from the parl. opposition at

this point suggests that it was at this stage that Parliament really ceased to defend its estab. rights and became, instead, the innovator in the constitutional struggle. Sev. of C.'s future actions, though unrealistic, were in fact more firmly based on precedent than those of his opponents. In 1629 Buckingham was assassinated. In the same year C. dissolved his third Parliament, but not until they had passed a resolution condemning his alleged innovations in religion and the collection of tonnage and poundage. From 1629 to 1640 C. ruled without a Parliament. The 11 years' 'tyranny' involved C. in many attempts to raise money for his immediate needs. In almost every way he roused antipathy; he levied tonnage and poundage; in 1634 he made his first levy of ship money, and in the following year he made another levy, this time on the inland tns as well. In 1638 came the great Hampden case, when C.'s right to levy ship money was acknowledged by the courts. His religious policy also roused the ill-feeling of many of his most influential subjects. The High Church party was favoured, the Catholics intermittently tolerated, and the Puritans persecuted. His Scottish policy precipitated matters. In 1633 he had visited Scotland for his Scottish coronation; in 1636 Laud's liturgy was introduced; in 1637 this led to a riot in St Giles's Cathedral and to the signing of the Covenant. A general assembly was called, but when this assembly proposed to discuss episcopacy it was dissolved by the high commissioner. The assembly, however, refused to dissolve and abolished episcopacy. Having done this, it prepared to meet the king in arms. The king, finding himself unable to raise sufficient forces, on the advice of Strafford called Parliament. Strafford apparently believed that, faced with a Scottish war, Parliament would forget its quarrels with C. and vote him supplies; but he was mistaken. The Short Parliament met in 1640; it immediately began to discuss grievances and was immediately dissolved. C. again went N. to attack the Scots, and again found it impossible to meet force with force. The result was that peace was made with the Scots practically on their own terms, and C., his finances utterly exhausted, was forced (Nov. 1640) to call what became known as the Long Parliament. The 11 years' arbitrary rule was over. Fervent Parliamentarians might rejoice; but to the mass of the people, the conflict that was to follow it was infinitely more painful in its effects. The Parliament which met in 1640 was in no mood for trifling. Its first aim was to bring about the destruction of its former champion, Strafford, and, all other means failing, this was done by attainting him. C. signed Strafford's death-warrant, sacrificing his most loyal and capable servant to fears for the queen's safety. His treatment of Strafford throughout shows to the full the weaknesses in C.'s own character. Parliament forced concession after concession out of C. Parliament was only to be dissolved with its

own consent, the Star Chamber and High Commission Court were abolished, and ship money was declared illegal. In 1641 C. was forced to listen to the Grand Remonstrance (q.v.), and early in Jan. 1642 he made the disastrous attempt to imprison the 5 members (q.v.). The next Parliament demanded control of the army. By this time it had alienated a strong body of opinion by its extremist policy. When C. made it clear that he would give in no further this moderate section rallied to his support. In Aug. 1642, after a series of abortive negotiations with Parliament, C. raised his standard at Nottingham. The early stages of the war went on the whole in his favour, but after the formation of Cromwell's Ironsides victory after victory fell to the Parliamentarians. The 2 great disasters with which the king met were Marston Moor and Naseby (qq.v.) where the New Model Army crushed the Royalists utterly. On 5 May 1646 the king surrendered to the Scots, who handed him over to the Eng. parl. forces. He was kept 4 months at Holmby House, near Northampton, but in the midst of his negotiation with Parliament he was seized by the army, who imprisoned him at Hampton Court (1647), clearly anxious to avoid at all costs the possibility of his coming to terms with Parliament. C.'s subsequent attempts to escape, and his efforts to ally with the Scots against his captors, made the extreme army Puritans, Cromwell (q.v.) among them, convinced that only his death could ensure that the principles for which they had fought were not endangered. In Jan. 1649 Parliament, having been cleared of all possible supporters of the king by Pride's purge, resolved to bring the king before a high court of justice. On the 10th the trial began. The king refused to recognise the jurisdiction of the court, and throughout behaved with magnificent dignity and self-possession. His execution, however, was resolved upon, he was brought up to hear the sentence passed upon him on the 27th, and was not allowed to make any answer to the charges. He was executed before Whitehall Palace on 30 Jan. The manner of his death, the blatant illegalities and irregularities of his trial made him appear a martyr, and eventually produced a popular reaction in favour of his family. Probably to C., more than to anyone else, the Church of England owes its survival in its present episcopal form. Though many of his actions are not free from the taint of double-dealing, his religious sincerity is undisputed: it was the one aspect of his policy in which his wife never influenced him, and his stubborn pursuit of religious objectives that were fundamentally unrealistic (for example his attempt to impose Laud's liturgy in Scotland) was a primary cause of the events which set in motion the conflict which was to cost him his life. See the Maseros Papers, which include much contemporary evidence of the relations between C. and Parliament, including an account by Denzil (Lord) Holles, *Calendars of State Papers, 1625-1649*, 1858-97; S. R. Gardiner, *A History*

of the Great Civil War, 1893; lives by F. M. G. Higham, 1932, and E. Wingfield-Stratford, 1949; C. V. Wedgwood, *The King's Peace*, 1955; A. French, *Charles I and the Puritan Upheaval*, 1956.

Charles II (1630-85), King of Great Britain and Ireland, b. at St James's Palace, London, son of Charles I. During the Civil war he was with his father during the early events, but after the defeat at Naseby he went to Falmouth, and from thence to Scilly. From Scilly he went to join the queen in Paris, and he remained there for 2 years. On the execution of his father in 1649, he was immediately proclaimed king in Scotland, and in 1650, having signed the Solemn League and Covenant, which he can hardly have intended keeping, he embarked for Scotland. On 1 Jan. 1651 he was crowned at Scone, and on 3 Sept. his forces, having penetrated England as far as Worcester, were defeated by Cromwell. C., who distinguished himself by his bravery during the battle, fled, and after wandering in disguise throughout the country for 6 weeks, at last escaped to France. In 1654 relations between England and France having altered, he was forced to quit France, and spent the rest of his years of exile in wandering from one country to another. These years of exile undoubtedly marked C.'s character permanently, making him determined in the future to keep his crown at all costs; while the poverty of this period undoubtedly accounts in part at least for the extravagance and dissipation of his later life. After Cromwell's death in 1658 it was soon obvious that C.'s restoration was only a matter of time, and it was eventually brought about through the influence of George Monck, Duke of Albemarle, who conducted the negotiations with the exile. On Monck's advice C., in April 1660, issued the Declaration of Breda (mainly the work of Clarendon), and early in May he was declared King at Westminster. Towards the end of the month he set forth from Breda and landed at Dover, where he was received with great enthusiasm everywhere, the nation as a whole being heartily sick of Puritanism and military despotism. In 1662 C. married Catherine of Braganza.

The first 7 years of C.'s reign were passed under the tutelage of Clarendon (q.v.). The Restoration settlement was not followed by any very great persecution of Cromwell's supporters; a number of the regicides were executed, but on the whole the Restoration was tolerant, except in religious matters, and some of the bitterest complaints were to come from Royalists, who, having sacrificed their possessions and property in the Stuart cause, never received complete restitution as this would have alienated important ex-Cromwellian interests. The Cavalier Parliament, however, restored the episcopal church and the prayer book in England, and in a similar manner bishops were restored to Scotland. The early years of the reign were disgraced by the Dutch war, during which the

Dutch sailed up the Thames and destroyed the shipping there. In 1667 Clarendon was dismissed, and Buckingham and Arlington became the chief ministers; these, together with Lauderdale, Ashley, and Clifford, formed in 1672 the famous Cabal (q.v.). It was during this period that C. entered into those close relations with France which made him almost the pensioner of the Fr. king, gained him incidentally a fresh mistress in Louise de Kéroualle, and which have been criticised as costing England her natural foreign policy, i.e. to attack the aggrandisement of France. In 1670 was



N.P.G.

CHARLES II

The painting by J. M. Wright.

signed the secret treaty of Dover, which pledged C. to becoming a Rom. Catholic, and gave him a pension of £200,000 per annum. While it is true that this treaty led to England becoming involved with France in the second Dutch war, from C.'s personal point of view it was a most astute political manoeuvre, and probably caused considerably less harm to his country than later Whig historians have alleged. C. was always anxious to prevent himself becoming the financial prisoner of Parliament, and Louis's money provided the solution. In return, C.'s promise to become a Catholic was not restricted to a particular date, and in fact C. did not declare himself a Catholic until he was dying, though he had undoubtedly had Catholic sympathies for many years before this, and made various attempts to increase toleration for Catholics and Dissenting Protestants. The Cabal ministry met with considerable opposition in the country, and many of the acts of the king and his ministers at this time were extremely unpopular. The 'stop of the exchequer' ruined a number of

people, and the second Declaration of Indulgence was declared illegal by Parliament, and the Test Act was passed. In 1677 William of Orange married Mary, the elder daughter of James, Duke of York, an incident which proves C.'s ability to act independently against Fr. interests when he so desired. Foreign affairs were soon overshadowed by the affair of the 'Popish Plot,' 1678-80, which C. eventually turned to his own advantage. He recognised that it had received general credence in the country, and he allowed it to continue, knowing full well that in the course of time the falseness of it would be discovered. The Protestant party next pressed for the exclusion of James, Duke of York, from the crown. C., whilst reiterating that he would never consent to the Exclusion Bill, sent James out of the country for a short time, and declared his pleasure at the attempts to convert James to Protestantism. The exclusionists, however, went too far in asserting the claim of James, Duke of Monmouth, who was C.'s illegitimate son by Lucy Walters. In the Parliament of Oxford, by insisting on the recognition of the Duke of Monmouth, they played into C.'s hands. Parliament was dissolved, and C. appealed to the nation at large, which supported him against the extremists. For the rest of the reign C. was supreme, his position strengthened by the standing army which he now controlled, which he had been able to raise quite legitimately during the various crises, but had refrained from disbanding. His popularity was immense, and was increased by the discovery of the Rye House Plot, for which Sidney and Russell were executed. C. left no children by his wife, but a numerous progeny by his many mistresses. By Nell Gwynn (1650-1687) C. was father of Charles Beaulieu, Duke of St Albans (1670-1726). Louise de Kéroualle (1649-1734), who was made Duchess of Portsmouth (1672) and Duchesse d'Aubigny in 1684, was mother, by C., of Charles Lennox, Duke of Richmond (1672-1723). Other mistresses included 'la belle Stewart' (Duchess of Richmond) and (before the Restoration) Lucy Walters. C. was the most capable of the Eng. Stuarts, his indolence and extravagant living concealing a shrewd sense of politics, an ability to sense the exact moment at which compromise was essential, or when ruthless action was safe. If his policy was amoral, it was in fact no more so than that of the vast majority of politicians of the time, and their characters make it hardly surprising that C. should prefer to put his trust in his own judgment and in Fr. gold. He was a patron of the arts, and genuinely popular with the common people. See the diaries of Pepys and Evelyn, and Clarendon's *History*; see also lives by O. Airy, 1904, and A. Bryant, 1931.

Charles II (1661-1700), King of Spain, son of the old age of Philip IV, whom he succeeded in 1665. He was from infancy weak, deformed, and diseased, and it was soon obvious that he would never be

capable of ruling for himself and would probably not live long. The whole of his reign was taken up with struggles between the Austrian and Fr. parties at court. Each of these scored a triumph by arranging marriages for the king. The Fr. party married him to a Fr. princess, and on her death he was married to an Austrian princess, but both marriages were childless, and the question of his succession absorbed Spain and all Europe for sev. years before his death. Finally, on his death-bed, he was persuaded to sign a will leaving the Sp. dominions to Philip of Anjou, grandson of Louis XIV. This led directly to the War of the Sp. Succession (q.v.).

Charles III (1716-88), King of Spain, eldest son of Philip V of Spain by his marriage to Elizabeth Farnese of Parma. He was Duke of Parma by right of his mother, and spent his early youth in Italy. In 1734 he became King of the Two Sicilies, and on the death of his half-brother, Ferdinand VI of Spain, he succeeded to the Sp. throne (1759). He signed the family compact with France, and took part in the later phases of the Seven Years War against England (against which he had a personal animosity) disastrously. He again joined the French in 1779 in their attacks upon England during the Amer. War of Independence. His internal policy was considerably more enlightened and successful. He had already made substantial internal reforms in Sicily. He expelled the Jesuits from Spain, encouraged the construction of new roads and canals, and followed the pattern of contemporary 'benevolent despots' in Europe. See J. Addison, *Charles the Third of Spain*, 1900.

Charles IV (1748-1819), King of Spain, the second son of Charles III. He succeeded his father in 1788, but devoted his time to pleasure, leaving the gov. of the country to be administered by the queen and her lover, Godoy (q.v.). He was terrified by the excesses of the Fr. Revolution, and attempted by a policy of extreme reaction to prevent the growth of a 'reforming' party in Spain. He was a man of great credulity, and it seems possible that he never understood the relationship between Godoy and his queen. In 1808 he abdicated in favour of Joseph Bonaparte, and lived in exile until his death in Rome.

Charles I (Karl Franz Josef) (1887-1922), last Emperor of Austria-Hungary, eldest son of Archduke Otto and Princess Maria Josepha of Saxony, and became heir-presumptive to his great-uncle, Francis Joseph, in 1908. In 1911 he married Princess Zita of Bourbon-Parma. He succeeded to the throne, 21 Nov. 1916, in the middle of the First World War; he made unsuccessful efforts to conclude a separate peace in 1917. In Nov. 1918 C. renounced control of affairs of Austria, and, temporarily, of those of Hungary. He left Austria for Switzerland in Mar. 1919, and next month the Austrian Parliament formally deposed him. In 1921 he made 2 unsuccessful attempts to

regain the Hungarian throne, and *d.* in Madeira the following year.

Charles I and II, of Rumania, see CAROL.

Charles, Elizabeth, née Rundle (1828-1896), *b.* Tavistock, Devon. She was the author of many books of a semi-religious character, the chief of which, *The Chronicles of the Schönberg-Cotta Family*, 1864, is about Martin Luther, and has been trans. into most of the European languages, into Arabic, and many Indian dialects. Others of her books are *The Diary of Mrs Kitty Trevellian*, 1865, dealing with the rise of the Methodists in England; *The Draytons and the Davenants*, 1867, about the Eng. Civil War; *On Both Sides of the Sea*, 1868, a tale of New England. Among her friends were Dean Stanley, Charles Kingsley, Jowett, and Pusey (qq.v.).

Charles, Robert Henry (1855-1931), theologian, *b.* in co. Tyrone, N. Ireland; educ. at Queen's Univ., Belfast, and Trinity College, Dublin. He left parochial work in 1889 to devote himself to the studies which made him famous, choosing a line of research, the Testaments of the Twelve Patriarchs, till then little known and involving the acquisition of oriental languages. He began the series of these ed. in 1893 with *The Book of Enoch*, continued with kindred documents, and ended with the *Testaments of the Twelve Patriarchs* in Greek, with variants from the versions in Hebrew, Aramaic, Armenian, and Slavonic, in 1907. He was Schweich lecturer for the Brit. Academy, and received the first award of the academy's medal for biblical studies. His industry as an editor made him a master of the thought and doctrinal development of the age of the Apocrypha, as appears in his historical study, *A Critical History of the Doctrine of a Future Life*, 1899, and in *Religious Development between the Old and the New Testaments*, 1914. His ed. of *The Apocrypha and Pseudepigrapha of the Old Testament* was issued in 1913, and throughout the years of the First World War he laboured at his great work on the Book of the Revelation of St John, with a succession of students to assist him. This book is notable for positive pronouncements on points generally regarded as largely conjectural, and it roused the resentment of the advocates of literal inspiration; but, generally speaking, it has met with the widest commendation. C. was appointed to a canonry at Westminster Abbey in 1913 and became archdeacon there in 1919.

Charles, Thomas (1755-1814), Welsh preacher and author. He early came under the influence of Rees Hugh, a disciple of Griffith Jones, and joined a Methodist society. He met many noted evangelical leaders at Oxford from 1775 to 1784; in the latter year became curate of a charge in Somerset. His opinions made it difficult for him to retain a post in the Estab. Church, and after 1784 he threw in his lot altogether with the Methodist Church. He did much valuable work in the introduction of Sunday schools, and

the printing and distribution of religious books in Welsh.

Charles Albert (1798-1849), King of Sardinia, the son of Prince Charles of Savoy-Carignano. In 1821 a revolution forced the king (Victor Emmanuel I) to abdicate, and C. A., who was regarded as a liberal by traditional monarchists, became regent for the new king, Charles Felix. He granted a constitution which was repudiated by the king, and he was forced into exile. In 1823 he fought in Spain, and in 1831 he succeeded Charles Felix. He attempted to reform the finances and administration of Piedmont, but was only partially successful. In 1848 he granted a liberal constitution, and in the same year declared war on Austria, and was badly beaten at Custoza. The following year he was beaten at Novara, and subsequently abdicated in favour of his son and retired to a monastery, where a few months later he died. See L. Cappelletti, *Storia di Carlo Alberto*, 1891; C. de Beauregard, *La Jeunesse du roi Charles Albert*, 1899; A. di Saluzzo, *Carlo Alberto della restaurazione all'avvenimento al trono*, 1926.

Charles Augustus (Karl August) (1757-1828), Grand Duke of Saxe-Weimar. His father d. when he was very young, and the duchy was administered by his mother until C. A. came of age in 1774. His reign is noted for the enlightenment of the policy which he adopted. Wieland had been his tutor, and he introduced Goethe to the court and into his councils, and allowed his people an unusual amount of civil freedom. His policy speedily made the univ. of Jena the most important in Europe. The revolutionary wars found him fighting in the ranks of the Prussian Army, and he fought against Napoleon until the Jena campaign forced him to join the confederation of the Rhine. Again in 1812 he was in arms against Napoleon, and continued so until the end. In 1815 he took part in the Congress of Vienna and pleaded hard for the recognition of the rights of the people. He granted a liberal constitution to his own people, and was one of the few princes who were not driven by the excesses of the Fr. Revolution to a policy of reaction.

Charles Edward, see STUART, CHARLES.

Charles Louis (1771-1847), Archduke of Austria and Duke of Teschen, the third son of the Emperor Leopold II; became one of the most distinguished generals of the Napoleonic period. He began his career as a soldier during the revolutionary wars, being at that time stationed in the Netherlands. He commanded a brigade at Jemappes, and during the subsequent campaigns proved himself a general of such ability that in 1796, after serving for a year with the army of the Rhine, he was given the chief command of that army. His campaign of 1796 was one of the most brilliant of the whole of the war. He defeated Jourdan twice during the year, and finally drove the French across the Rhine. Although in the following year he found Napoleon more than a match for him, he again showed his consummate

skill as a general in the manner in which he conducted the retreat of his armies. The campaign of 1799 found him again in command of the Austrian armies of the Rhine and again opposed to his old enemy Jourdan. He defeated the Fr. general twice during the year, and even tried conclusions successfully with Masséna, and once more he forced the French to retire over the Rhine. After this campaign ill health drove him for a short time into retirement in Bohemia, but he again commanded the Austrian armies during the short campaign which preceded Hohenlinden, and after that battle concluded an armistice with the French. In 1805 he took up the command of the armies in Italy, but events in Germany soon drew him from there, where he had fought the battle of Caldiero and defeated Masséna. The peace which followed the disasters of Ulm and Austerlitz was used by the archduke to reorganise the Austrian forces. In 1809 he again became commander-in-chief of the Austrian Army, which he had not yet been able completely to reform. The struggles of the Austrians against Napoleon were not altogether unsuccessful, and the victory of Aspern had certainly a good moral effect on the rest of Europe. Aspern was followed by Wagram, where the Austrians were totally defeated, although not before they had made a most desperate struggle. This was the last battle in which the archduke took part. He lived the rest of his life in retirement, becoming Duke of Saxe-Teschen in 1822.

Charles Martel ('the Hammer') (c. 689-741), Frankish king, son of Pépin d'Héristal (q.v.), mayor of the palace under the later Merovingian kings, grandfather of Charlemagne. In 714 the Austrasian Franks chose him as their duke: by force of arms he united the kingdoms of Neustria and Austrasia, 720, becoming actual ruler of the Franks, the titular kings (among them Chilperic II and Clotaire IV) being merely his puppets. He fought against Saxons, Alemanni, and Bavarians, and rolled back the tide of Muslim conquest in the decisive battle between Tours and Poitiers, 732. For this crushing defeat of the Saracens he was given his surname, and looked upon as the saviour of Christendom. C. tried to convert Saxony and Frisia to Christianity and helped St Boniface in his missions. He again drove the Saracens out of Burgundy and Langue doc, 737. On his death he left the kingdom to his sons, Carloman and Pépin le Bref.

Charles of Blois (1319-64), Duke of Brittany, also known as C. of Châtillon. A nephew of Philippe VI of France, he married the daughter of Guy of Brittany and thus acquired a claim to succeed to the Duchy of Brittany. On the death of John III, Duke of Brittany, in 1341, this claim matured but was disputed. C., aided by his uncle, took prisoner his rival, John, Count of Montfort-l'Amaury, who was supported by Edward III of England. However, C. soon suffered a reverse of fortune and was himself taken prisoner in 1347. He was released in 1356 and

continued the war against his old rival's son, also called John. C. was killed at the battle of Auray. A man noted for his personal piety, he was beatified by the Rom. Church in 1904.

Charles of Orleans, *see* ORLEANS, CHARLES, DUKE OF.



Portrait by Anthony Armstrong-Jones
H.R.H. PRINCE CHARLES

Charles Philip Arthur George, Duke of Cornwall (1948-), was b. at Buckingham Palace on 14 Nov., the first child of Princess Elizabeth (subsequently Queen Elizabeth II) and the Duke of Edinburgh. On the death of his grandfather, George VI, in 1952 he became heir-apparent to the Brit. throne, and Duke of Cornwall. In the peerage of Scotland he is Duke of Rothesay, Earl of Carrick, and Baron Renfrew, Lord of the Isles, and Prince and Great Steward of Scotland.

Charles the Bold (le Téméraire) (1433-1477), Duke of Burgundy, son of Philip the Good. In 1465, owing to his father's illness, he became the practical ruler of the duchy, and adopted at once his policy of opposition to the centralising aims of Louis XI. He succeeded after hard fighting in wresting from Louis XI, by the treaty of Conflans, some of the privileges which Louis had gained some years earlier, and also married Louis's daughter, Catherine. Just before the death of his father, he had to subdue a serious revolt of the townsfolk of Liège, a revolt which was renewed when he succeeded to the duchy (1467). Negotiations to reach some kind of settlement with Louis took place at Péronne, with little effect, and in the following year Louis seized some towns on the Somme, whilst C. invaded France and laid it waste as far as Rouen. From 1470 onwards C. was intent on wider schemes than simply checking the ambition of Louis. He

desired the restoration of the middle kingdom, and aspired to the crown himself. He had added to his ter. and power, but in so doing he had made many enemies. He had offended the emperor, he was at enmity with the Lorrainers and Swiss, and finally, after sev. defeats, he was overthrown and slain before Nancy. The death of C. extinguished the male line of the Dukes of Burgundy, and with it the grandeur and importance of the duchy. C. had left an only daughter, Mary, who succeeded to all the dominions of her father out of France. She married the Archduke Maximilian, through whom her Flem. possessions descended to the Sp. branch of the House of Austria. *See* lives by R. Putnam, 1908, and J. Bartier, 1944.

Charles's Law, *see* GAS AND GASES.

Charles's Wain, *see* URSA MAJOR.

Charleston: 1. Cap. city and seaport of C. co., S. Carolina, U.S.A., standing on a low tongue of land between the R.s Ashley and Cooper, 7 m. from the Atlantic. The 2 rivs. unite just below the city and form a spacious harbour, about 15 sq. m. in area. Across the entrance is a sandbar with only about 18 ft of water, but having a deeper channel near Sullivan's Is. By recent improvements vessels of 24-ft draught can safely enter. The city is regularly and handsomely built, retaining many of the features of old S. architecture, and having a profusion of trees and gardens. Standing as it does in a rich cotton and rice dist., C. has a large trade, and is the chief commercial city of S. Carolina. It is the terminus of railway and transportation lines, and steamships run regularly to and from the chief ports of the U.S.A., the Antilles, S. America, and Europe. The chief exports are cotton, rice, phosphate, naval stores, lumber, and grain. There are machine-shops, shipyards, dry docks, and manufs. of cotton, petroleum, chemicals, pulp and paper products, steel, ferro-alloys, asbestos, paint, textiles, canned goods, cigars, flour, baggage, and fertilisers, the last being the main industry owing to the large deposits of lime-phosphates found on the Ashley R. C. is the seat of a Catholic bishop, the College of C. (1785), the Medical College of S. Carolina, and the Citadel (military college). Here also are a seaplane base and navy yard. The city was founded by the British under Wm Sayle about 1670. The Civil war began in 1861 with the capture by the S. Carolinians of Fort Sumter, on an is. 1 m. below the city. It suffered terribly in an earthquake in 1886. Pop. 70,175.

2. Cap. of W. Virginia, U.S.A., and co. seat of Kanawha co., on the N. bank of the Kanawha R., at the mouth of the Elk, about 200 m. E. of Cincinnati, Ohio. It is the centre of a dist. containing bituminous coal, oil works, iron and salt mines. The manufs. include axes, chemical fire-extinguishers, lumber, furniture, and woollen goods. Huge chemical industries utilise the resources of salt brine, coal, oil, gas, etc. Pop. 73,500.

Charlestown: 1. Fishing vil. and seaport of Cornwall, England, 2 m. SE. of

St Austell, exporting china clay. Pop. 500.

2. Chief tn of Nevis Is., Leeward Is., W. Indies. Pop. 1100.

3. Originally a city in the state of Massachusetts. It is now, however, a part of Boston, and contains the Bunker (or Breed's) Hill monument (221 ft high) commemorating the battle of that name.

Charlet, Nicolas Toussaint (1792-1845), Fr. painter and draughtsman, b. Paris. He served in the National Guard in 1814, but lost his employment as clerk in the *mairie* (1816) owing to the political changes. He then studied art under Gros, and was particularly successful in military subjects ('Grenadier de Waterloo,' 1817) and sketches of children. *See* La Combe, *Charlet, sa vie et ses lettres*, 1858.

Charleville: 1. *See* RATHLUIRC.

2. Tn in Queensland, Australia, 483 m. W. of Brisbane, centre of sheep-grazing area. Pop. 4510.

3. Fr. tn in the dept of Ardennes, on the Meuse, opposite Mézières. It was founded in 1606 and built to a plan. It has manufs. of metal goods, firearms, and nails. Rimbaud (q.v.) was b. and is buried here. Pop. 19,500.

Charlevoix, Pierre François Xavier de (1682-1761), Fr. Jesuit missionary and traveller, b. Saint-Quentin; joined the Jesuits, 1698; taught in their college at Québec, 1705-9; travelled up the Great Lakes and down the Mississippi to New Orleans, 1720-2. Wrote a jour., sev. hist.s., and *Histoire et description générale de la Nouvelle France*, 1744 (Eng. trans. by J. G. Shea, 1866-72).

Charlieu (anct *Carilocus*), Fr. tn in the dept of Loire, on the Sornin. It has the remains of an 11th-cent. priory, and many old buildings. Silk is manuf. Pop. 5000.

Charlock. There are 2 species: *Sinapis* (synonym *Brassica*) *arvensis*, also known as Wild Mustard, a yellow-flowered, troublesome weed of arable land, and *Raphanus raphanistrum*, White C., or Wild Radish, or Runch, a weed of non-calcareous soil; both of the *Cruciferae* family. Now controlled by spraying with selective weed-killers or acids.

Charlotte (1896-), Grand-Duchess of Luxembourg and Duchess of Nassau. She became Grand-Duchess in 1919 on the abdication of her sister; she married Felix of Bourbon-Parma in the same year. During the Ger. occupation of Luxembourg during the Second World War C. went into exile in England with her family. The heir-presumptive is her son, Prince Jean, b. 1921.

Charlotte (Sophia) (1744-1818), Queen of Great Britain and Ireland, wife of George III, whom she married in 1761. She was a Princess of Mecklenburg-Strelitz. The marriage was extremely happy, the queen devoting herself entirely to her large family (she bore George 15 children) and taking no part in public life.

Charlotte Amalie, the only tn on the is. of St Thomas (q.v.) in the Virgin Is. group (belonging to the U.S.A.). It was so

named after the consort of King Christian V of Denmark, to which country the is. belonged up to 1917, when it was purchased by the U.S.A. The U.S. Geographic Board decreed on 5 Jan. 1921 that the tn would in future be known as St Thomas, but its more picturesque name was restored to it in 1937. The harbour is one of the finest in the W. Indies; there is a large fuelling station, a floating dock, an international cable station, and an airport. Bay rum, rum, and handicraft products are made in the tn. Pop. 10,400.

Charlotte Augusta, Princess (1796-1817), only child of George, Prince of Wales (afterwards George IV), and Caroline of Brunswick. Her parents separated when she was a few months old, and while she lived she was a source of contention between them. On 2 May 1816 she married Prince Leopold of Saxe-Coburg, and died in childbirth on 5 Nov. of the following year. C. was extremely popular. *See* lives by Lady Rose Weigall, 1874, and G. J. Renier, 1932. There is a biography by Lady S. M. Weigall, 1874.

Charlotte, co. seat of Mecklenburg co., N. Carolina, U.S.A., on Sugar Creek, in the SW. of the state, 175 m. SW. of Raleigh. It is the terminus of sev. rail-ways, and has manufs. of cotton and woollen goods, hosiery, machinery, electrical equipment, dyestuffs, cottonseed oil, fertilisers, flour, paper boxes, and furniture. A branch mint was estab. here in 1837, and the Queens College (women) in 1857 and Johnson C. Smith Univ. (for coloured students) in 1867. Pop. 134,042.

Charlottetown, former tn of Brandenburg, incorporated in 1920 into Berlin (q.v.). It is 5 m. W. of the city centre, and is a residential as well as industrial dist. It grew up around the palace built here in 1696 by Frederick I (q.v.) of Prussia for his second wife. In the mausoleum of the palace park are the tombs of Frederick William III and Queen Louisa (qq.v.). C. was heavily damaged during the Second World War in allied air-raids and during the Russian advance into Berlin. Chemicals, glass, paper, and iron goods are manuf.

Charlottesville, city in (but independent of) Albemarle co., Virginia, U.S.A., on R. Rivanna, 65 m. NW. of Richmond. It is the seat of the univ. of Virginia, founded by Thomas Jefferson in 1819, which has a fine natural hist. museum, an observatory, and a library. It is also the seat of the Institute of Textile Technology. It manufs. textiles, machinery, wood products, clothing, beverages, and metal products, and there is soapstone and slate quarrying. Pop. 25,965.

Charlottetown, cap. of Prince Edward Is., Canada, situated on the S. side of the is., in Queen's co., on Hillsborough Bay, possessing a large and safe harbour. Its chief buildings are 2 hospitals, a sanatorium, St Dunstan's Basilica, and the Federal and Prov. Buildings. Its manufs. include canned goods, woollens, powdered milk, and butter. It has an airport, also a meat packing plant and one for

mixing commercial fertilisers. Pop. 16,446.

Charlton, dist. of London, in the NE. of the bor. of Greenwich. C. House, built 1607-12, is a fine Jacobean building. Spencer Perceval, the only Eng. prime minister to be assassinated, is buried in the par. church.

Charm (through Fr. from Lat. *carmen*, a song), form of words, generally a verse, which when said or sung is supposed to have power to avert evil or bring good luck. When worn in written form about the person it is called an amulet. The meaning of the term has been extended figuratively to pleasing qualities of appearance or manner. See AMULET and INCANTATION.

Charmey, vil. in the canton of Fribourg, Switzerland, 15 m. S. of the tn of Fribourg. A favourite tourist resort, and the centre of the Gruyère cheese industry.

Charmouth, par., vil., and watering-place in W. Dorset, England, 6 m. SE. of Axminster. Pop. 700.

Charnel-house, place for the deposit of bones thrown up in digging. Sometimes a separate building, but often a part of the crypt of a church.

Charnock, Job (d. 1693), Eng. founder of Calcutta. Arrived in India about 1653, and entered the E. India Co. He refused to move when besieged by the Mogul's viceroy at the vil. of Sutanati, and finally obtained the grant of the site upon which Calcutta now stands.

Charnwood Forest, tract in the NW. of Leics, England. Though no longer thickly wooded, C. F. with its outcrops of pre-Cambrian rocks and rugged outline, is an area of considerable charm. It lies over 400 ft above sea level, and its highest point is Bardon Hill (912 ft). Geologically it is an area of great interest. The soil is of only moderate quality and at the time of the Norman Conquest C. F. was an uninhabited waste; settlement did not begin to take place until the 12th cent. It contains granite quarries from which come the Mountsorrel setts and the Whittle Hill bones, and the Leics coal-mines lie on the W. and NW. fringe. It was enclosed in 1829, by Act of Parliament passed 21 years earlier. In the forest are the remains of Ulverscroft Priory, founded c. 1153, but largely dating from the 14th cent. Part of the ruins are now incorporated in a farm. Also in C. F. is the Cistercian Abbey of Mount St Bernard.

Charolais, or **Charollais**, old dist. of France, in the S. of Burgundy, now part of the dept of Saône-et-Loire. The counts of C. took their title from it. The dist. now is famous for its cattle. Charolles (q.v.) was the cap.

Charolles, Fr. tn, cap. of an arron., in the dept of Saône-et-Loire, at the confluence of the Arconce and the Semence. The ruined hill-top castle of the Counts of Charolais (q.v.) has been incorporated into the tn hall. There is a cattle market, and pottery and light metal manufs. Pop. 3400.

Charon, son of Erebus and Nyx, ferried the souls of the dead across the

rivers of the lower world. Each shade paid him one obolus, which was placed in the mouth of the body before burial.

Charon of Lampasacus, Gk historian, probably of the early 5th cent. bc, and certainly before Herodotus. He is known to have been alive in 464 bc. His works, which include hists. of Lampasacus, Crete, and Persia, have survived only in fragments, which have been ed. by F. Creuzer (Heidelberg, 1806) and by C. and T. Müller (Paris, 1841). He is mentioned by Tertullian and Suidas.

Charondas (fl. c. 500 bc), celebrated Gk law-giver of Catana, Sicily. His laws were adopted by the Chalcidian colonies in Italy and Sicily, and according to Aristotle their chief import lay in the precise rules against perjury, fines on judges who neglected their duties, etc. The story of his suicide because he broke one of his own laws is also told of Diocles and Zaleucus.

Charonne, dist. in the W. of Paris, a former tn joined to the city in 1860. In the churchyard of St-Marguerite's Church here is the supposed grave of Louis XVII (q.v.).

Charpentier, Gustave (1860-1956), Fr. composer, b. Dieuze, 25 June. After studying at the Lille Conservatoire, he was awarded a scholarship to enable him continue study in Paris, where he went 1881. Six years later he received the rix de Rome for his cantata *Didon*. In 1902 he founded the 'Cercle Mimi Pinson' and the Popular Conservatoire to give free courses of popular music and in classical dancing. He succeeded Massenet in 1912 as a member of the Institute. His fame rests mainly on his opera *Louise*, 1900. His appeal is essentially popular and romantic, and he tries, not without success, to give social questions an appropriate musical setting, but *Julien*, a sequel to *Louise*, was a failure in 1913. Among his other works are *Impressions d'Italie* (orchestral suite), 1888, and *La Vie du poète* (symphonic drama), 1892. His songs include *Poèmes chantés*, 1894, *Les Fleurs du mal* (from Baudelaire), 1895, and *Impressions fausses* (from Verlaine), 1895. Consult Marc Delmas, *Gustave Charpentier*, 1932.

Charpentier, Jean de (1786-1855), geologist, b. Freiberg in Saxony. His fame as a geologist rests on his book *Essai sur les glaciers, et sur le terrain erratique du bassin du Rhône*, 1841, in which he extended and proved the theory, which had previously been evolved by Venetz, that the blocks on the slopes of the Alps and Jura, although of quite different sorts and periods of rocks, had been brought there by glaciers, and left when the glaciers themselves disappeared.

Charpentier, Marc-Antoine (1634-1704). Fr. composer, b. and d. Paris. Studied painting in Italy but gave it up for music, which he studied under Carissimi, whose work C. greatly admired. He was master of music in the household of Mlle de Guise, and he also gave music lessons to the Duke of Orleans, Regent of France. Became chapel master of the Sainte-Chapelle in 1698, and remained so till his

death. He was associated with Molière in the performance of some of his plays. His *Médée*, described as 'une tragédie lyrique,' words by Thomas Corneille, was performed in Paris (1693) with success, yet was never repeated. His other works include the operas *Circé* and *Amours d'Acis et Galatée*, but he is chiefly remembered for his oratorios, in the style of his It. master, and his masses.

Charr, or **Char**, name of sev. species of *Salvelinus*, a genus of the family Salmonidae; they differ from their allies in having teeth on the head only of the vomer. The deeper parts of fresh-water lakes are their favourite habitation; *S. alpinus*, the N. C., is common to England and Switzerland; *S. willughbi* is a native of Lake Windermere; and *S. fontinalis* is the Amer. brook trout.

Charrière, Isabelle Agnes van Tuyll, Madame Saint-Hyacinthe de (1741-1805), Swiss writer, b. Utrecht, Holland; married her brother's tutor and settled at Colombier, near Lausanne. Her *Lettres neuchâtoises*, 1784, and *Lettres de Lausanne*, 1785, are valuable documents of the cultural hist. of the time. From 1789 to 1794 she was the close friend of Benjamin Constant. See P. Godet, *Mme de Charrière et ses amis*, 1904.

Charrington, Frederick Nicholas (1850-1936), social reformer, b. Bow, son of Frederick C., a wealthy brewer. He gave up the succession to a fortune of over £1,000,000 in order to devote his time to temperance work. In 1885 he founded the Tower Hamlets Mission; he made the Great Assembly Hall in the Mile End Rd. a centre of Christian work in the E. end of London. One of the original members of the L.C.C., 1889-93. Prominent in an attack on music-halls. See C. A. E. Ranger-Gull, *The Great Acceptance; the Life Story of Frederick Charrington*, 1912.

Charron, Pierre (1541-1603), Fr. philosopher, b. Paris, son of a bookseller. An unsuccessful lawyer, he sought advancement through the Church and became preacher-in-ordinary to Marguerite, wife of Henri IV. In 1594 he pub. *Les trois vérités*, advocating the Catholic faith; but his notorious treatise, *De la Sagesse*, 1601, in the preparation of which he was largely indebted to his friend Montaigne (q.v.), reveals a strong atheistic current, and has caused C. to be recognised as the founder of modern secularism. See W. E. H. Lecky, *Rationalism in Europe* (2nd ed.), 1910.

Charruas, tribe of S. Amer. Indians, noted for their warlike propensities. At one time they inhabited Uruguay and part of S. Brazil, and Gauchos, who now occupy that part, have a strain of Charrua blood in them. They were well-made, dark-skinned people, and used horses in their wars with the Spaniards, their weapons being the bolas, or weighted lasso, and bows and arrows. Juan Diaz de Solis lost his life at their hands, 1516.

Charsadda, tn of W. Pakistan, 14 m. NW. of Peshawar. It is supposed to be the same as Pushkalavati, which was in existence at the time of Alexander the Great's invasion, and the Penkeleos mentioned by GK historians.

Chart, or **Sea-chart**, marine map, showing the coasts, is., lighthouses, and ships, soundings, currents, etc., of a part of the sea, compiled for the use of navigators. C.s seem to have been made as early as the 13th cent., the invention being variously ascribed to the Italians and to Prince Henry of Portugal. The first C. to recognise the roundness of the earth was produced by Mercator in 1569, and his system was improved by Edward Wright in 1594. Modern C.s are prepared in Great Britain by the hydrographic dept of the Admiralty. They are supplied gratis to the navy and sold to the merchant service through agents. Valuable C.s of the coasts of the U.S.A. have been pub. since 1807 by the Coast Survey. C.s are constructed with the greatest possible accuracy, and the use of recognised symbols admits of the inclusion of considerable detail. Prominent features on land which may serve as landmarks, shorelines at high and low water, details of tides in harbours, the proper courses for entering ports and channels, and the buoys marking them, etc., are shown. Signal stations and lights receive detailed attention, lights being shown by a yellow circle surrounding a red dot, with abbreviations describing whether the light is fixed, flashing, or revolving. Deep-water soundings are given in fathoms, and shallow-water soundings in feet. The character of the sea-bottom is also indicated, and sandbanks, bars, rocks (hidden, awash, or protruding), currents, and sunken wrecks are clearly shown. Lines of lat. and long. are drawn in, and sev. compass-roses, showing magnetic variation, appear on different parts of the C. The Mercator projection is generally used, but polyconic C.s are issued of small areas, and the gnomonic projection is used for mariners wishing to follow great-circle courses. After the Second World War, the hydrographic dept of the Brit. Admiralty commenced the task of recharting the oceans of the world with the assistance of the 'echo-sounder,' a device based on radar (q.v.), which records electric impulses reflected off the sea-bed, thereby giving a picture of its configuration. The aeroplane is also employed in modern chart-making in shallow waters. Simultaneous vertical air pictures on panchromatic film are taken by dual cameras, fixing the depth by contrast to within 3 ft. See Hydrographic Dept, *Charting the Seas in Peace and War* (H.M.S.O.), 1948.

Charter (Lat. *charta*, paper). The usual import of the word indicates any formal writing in evidence of a contract, or agreement between persons. In England the word is no longer used to signify a written document, though in France it is still in use. A C. is nowadays a document usually issued by the Crown to a corporation or institution conferring certain privileges and functions (e.g. professional bodies such as Chartered Accountants' Institute, and univs.). In Scotland, a C. is the written evidence of a grant of heritable property, under certain conditions enforced by the feudal law, i.e.

that the person receiving shall pay at stated times a sum of money to, or perform certain duties for, the person conferring the property.

Charter, the Great, see ENGLISH HISTORY and MAGNA CARTA.

Charter-party (fr. *charte-partie*, divided deed, one given to each party concerned), in maritime law a contract by which the owner or master of a ship lets the ship or part of her to a second party for the purpose of conveying goods from one port to another. It is one form of the contract of affreightment, the other being the bill of lading (used when the goods shipped form only part of the intended cargo). A C. may be a lease of the vessel (the charterer then assuming entire charge, while the master is only his agent), but more often it merely gives the shipper permission to have his cargo conveyed in the chartered vessel, the master assuming the responsibilities of a common carrier. Usually the C. describes the contracting parties, the ship, and the voyage. The shipowners state the ship is seaworthy, will take the cargo at a certain charge, and make the voyage as quickly as possible, delivering the cargo within a fixed time. The freighter agrees to load and unload within a certain number of lay or running days. The rate and time of payment for the freightage, and date of the beginning of demurrage, are also stated. The contract may be for a definite time, or for definite voyages. Perils of the sea for which the shipmaster declines to be responsible are noted down. See Scrutton, *Contracts of Affreightment as expressed in Charter-parties and Bills of Lading* (16th ed.), 1955.

Chartered Accountants in England and Wales, Institute of, incorporated by Royal Charter in 1880. Membership, which exceeds 19,500, is open only to persons who have passed the Institute's professional examinations and served in England or Wales under articles with a member practising as a public accountant. The normal period of service is 5 years, but a graduate of a univ. of the U.K. need not serve for more than 3 years. Members use the description 'Chartered Accountant' which has become a hall-mark of professional integrity and ability in business and finance. The Royal Charters confer the right to use the distinctive letters F.C.A. and A.C.A., denoting fellow and associate respectively. The H.Q. of the Institute are at Moorgate Place, London, E.C.2. See also ACCOUNTANT and INCORPORATED ACCOUNTANTS, SOCIETY OF.

Chartered Companies. The common element in C. C. at all stages of their development is the possession of a special charter from the Crown, granting them certain trading privileges in a particular locality, to be exercised subject to a varying degree of control by the Crown.

There appear to be 3 phases in the development of C. C. *First*, associations of individuals, emanating from early trading guilds, and enjoying a monopoly of trade in the exportation of Eng.

products to other European nations. England first granted a charter to a foreign country, the Hanseatic League, and, later, charters were granted to Eng. companies trading in the Baltic, Russia, and Turkey. *Secondly*, chartered associations possessing delegated sovereign powers of extraterritorial jurisdiction in the countries in which they traded. These came in consequence of the impulse given to foreign trade by the discovery of the New World and the opening out of trading routes to the Indies and America. Their object was to foster commercial intercourse with distant countries. The Russia Co., the Turkey Co., the Eastland Co. developed such relations with Russia, Turkey, and Persia. But the more important were the Hudson's Bay Co., and a number of other C. C. that opened up the Brit. N. Amer. colonies, and the famous E. India Co. The significance of these companies lies in the part they played in the building up of the foundations of the Brit. colonial empire through their acquisition of ter. either by the process of planting and settling in unoccupied regions or by conquest or cession of occupied land, as in the case of India. *Thirdly*, the purely joint-stock companies possessing no delegated sovereign powers, and trading under the direct control of the Brit. Gov. This phase of their development, or rather revival, was the expression of the desire for colonial expansion and commercial prosperity universally prevalent among the European nations towards the end of the 19th cent. The prin. Eng. C. C. formed during this period were the Royal Niger Co., chartered in 1886 and bought out by the gov. in 1899 for £865,000; the Imperial Brit. E. Africa Co., formed in 1889 to exploit Uganda and neighbouring districts, which fell into financial straits in 1892, with the result that Uganda became a Brit. protectorate some 2 years later; the Brit. S. Africa Co., chartered in 1889, and owing its origin to the activities of Cecil Rhodes, who secured various mining concessions from Matabele chiefs; and the Brit. N. Borneo Co., incorporated in 1881 to take over the concessions and ter. acquired from the sultan by a syndicate formed in Labuan in 1878. Some of the C. C. of the latter 2 places still exist as companies, but in most cases they have been merely a step, though an important one, in the transition from exploitation to colonial expansion, and their rights and treaties have for the most part been bought out by the Crown. The greater degree of success of the later companies in this direction was due to their more economic organisation, their control of a larger capital, enjoyment of better credit, their closer surveillance by the Brit. Gov. with a view to safeguarding the rights of native rulers, and the absence of any monopoly in trading rights. The rights of the Brit. N. Borneo Co. were bought out by the Crown in 1946 when N. Borneo became a crown colony.

Charterhouse, corruption of Chartreuse, formerly a religious house of the order of Carthusians (q.v.). The name occurs in

sev. places in England where members of the order estab. themselves, the most celebrated being the C. in Clerkenwell, London. It was founded in 1371 by Walter de Manny, famous as a soldier under Edward III, beside a chapel he had built in 1349, but Michael Northburgh, Bishop of London (*d.* 1361), is entitled to be regarded as co-founder. The monastery became noted for the austere purity of its life. The last prior, John Houghton, and the monks were barbarously executed (1535) for denying Henry VIII's headship of the Church. After the Dissolution the property passed through sev. hands, and much additional building was carried out until the C. was bought by Thomas Sutton (1532-1611), a native of Knaith, Lincs, who had made an enormous fortune out of coal, and was reputed the richest commoner in England. In 1611 he founded and endowed a hospital and free school, but the exact objects of the foundation were determined after his death in the same year. The hospital was set up for 80 'gentlemen' soldiers, merchants, or servants of the Crown, who had become poor through misfortunes, and the school for 40 poor boys. The number of men admitted to the hospital, though embracing more professions than in the original scheme, has progressively dwindled to the present figure of 17, but is to be increased to about 40. The school has become one of the great public schools of England, largely owing to Wm Haig Brown, appointed headmaster in 1863; to him was chiefly due the decision to move the school to Godalming, Surrey, in 1872, when the buildings were sold to the Merchant Taylors' School (*q.v.*). Scholars, until then nominated, were henceforth elected by examination. Latterly C. has widened its education beyond the traditional classical curriculum. Among its scholars have been Addison, Steele, and John Wesley, but the most notable was Thackeray, who introduced the school and hospital into some of his works, particularly *The Newcomes*. There are at present over 600 scholars. The original C. buildings, containing the finest Elizabethan hall in London, were severely damaged in the Second World War, but are being restored. See G. S. Davies, *Charterhouse in London*, 1921, and D. Knowles and W. F. Grimes, *Charterhouse: the Medieval Foundation in the Light of Recent Discoveries*, 1954.

Charteris, Leslie (1907-), Amer. novelist, b. Singapore, son of a Chinese surgeon and an Englishwoman. Educ. at Rossall and Cambridge, he was by turns rubber planter, miner, gold prospector, pearl-fisher, seaman, travelling showman, and bar-tender. His stories about a gentleman-burglar nicknamed 'the Saint,' began in 1930 with *Enter the Saint*, became extremely popular, and ran to some 2 dozen vols. In 1941 C. became a United States citizen.

Charters, Town, royal grants of certain privileges, rights, or immunities made to tns from early times. William I, seeing the importance of the tns, included most

of them in the royal demesne, and the practice arose of granting C. of incorporation, with privileges. Such privileges were, generally, the right of independent jurisdiction and the right of paying *firma burgi*, or a fixed sum as rent to the king in lieu of submitting to the exactions of the sheriffs. These C. were granted to the 'fully qualified members of the township or hundred court of the town,' either by the king, or, in the case of tns belonging to nobles, by the owner; thus Leicester obtained a charter from its earl and Beverley from Archbishop Thurstan. Most of the large tns seem to have been vested in the Crown in the time of Henry I, and by the reign of Henry III had succeeded in obtaining a clear recognition of their privileges and immunities. The readiness with which the tns undertook municipal gov., and the ease with which they were incorporated by charter, were due to the fact that they already had a more or less complete organisation in the guild system (Stubbs's *Select Charters*). When in course of time the election of the mayor of a municipal bor. passed from the whole body of burgesses to the aldermen and councillors, the latter formed themselves into a close corporation, ignored the rights of their fellow townsmen, and secured their position by applying for and obtaining C. of incorporation framed according to their wishes and modifying any charter or C. which the tn might already have possessed. This restrictive tendency was carried still further towards the end of the 15th cent. The rights of the freemen disappeared; the corporation came to be looked upon as the owner of the tn property, and developed into an exclusive oligarchy; and even the election of members of Parliament was, in some cases, entrusted into their hands. In this way the Crown could secure the return to the Commons of its own candidates; but the independence shown by the corporations under the Stuarts moved Charles II to remodel their C. He proceeded against the corporations by writ of *quo warranto* (*q.v.*), calling on the corporation to show by what authority it exercised its prerogative powers (it may be noted that in 1690 an Act of 2 William & Mary c. 8 declared all these legal proceedings null and void). The C. of the tns surrendered through the instrumentality of the notorious Judge Jeffreys were replaced by others 'framing the constitution of these municipalities in a more oligarchical model and reserving to the Crown the first appointment of those who were to form the governing part of the corporation' (Hallam). The very use of the word oligarchical shows that the king was concerned not for the rights of the burgesses but for his own powers. James II, in the hope of conciliating the nation over the abrogation of its privileges, restored a number of the old C.; but this in no way improved the position of the burgesses as a whole, and throughout the 18th cent. the principle of the close corporation was maintained and all the bor. patronage was in the hands of the councillors, who almost

invariably neglected their duties to the tn in order to further their own private interests. This corrupt state of things continued until the Municipal Corporations Act of 1835, which made provision for the election of the tn councillors by the burgesses or resident ratepayers. The Municipal Corporations Act, 1882, consolidated the law on the subject, which is now incorporated in the Local Government Act, 1933. See LOCAL GOVERNMENT; MUNICIPALITIES; and under the names of the various large cities and tns of Britain.

Charters Towers, tn in Queensland, Australia, 82 m. SW. from Townsville. Industries: pastoral (cattle), dairying, fruit growing, and mining. Pop. 6965.

Chartier, Alain (c. 1385-1433), Fr. poet and political writer, b. Bayeux, studied at the univ. of Paris. His first poem was *Livre des quatre dames*; his *Belle Dame sans merci*, 1426, was trans. into English by Sir Richard Ros about the middle of the 15th cent. He was made secretary to the dauphin, afterwards Charles VII. In 1422 he wrote his famous prose work *Quadrilogue invectif*, appealing to national patriotism to combine against the common enemy. By his eloquence he cheered his countrymen with the belief that the cause of France was not lost. His satire on the court, *Le Curial*, originally written in Latin, was trans. by Caxton, 1484. He attacked the vices of the clergy in the *Livre d'espérance*, 1429, and his *Breviaire des nobles* was studied by the youthful members of every noble household. His influence on Clément Marot, John Lydgate, and others was great. See E. J. Hoffman, *Alain Chartier*, 1942.

Chartists, name given to a body of political reformers (largely working men) formed in England about 1838. Discontent and disappointment were felt among the workers of Britain after Grey's reforms and the Bill of 1832, which did not enfranchise the working class, and this resulted in the movement known as Chartism, from the document or charter in which the agitators presented their demands publicly. In 1838, 6 members of the House of Commons held a conference with representatives of the Working-men's Association, and together they drew up the People's Charter for alleviating the sufferings of the artisans and labouring classes. They petitioned for (1) universal suffrage (of men), (2) abolition of the property qualification for a seat in Parliament, (3) ann. Parliaments, (4) equal representation, (5) payment of M.P.s, (6) vote by ballot. Among the chief Chartist leaders were Feargus O'Connor, Thomas Attwood, the Rev. J. R. Stephens, Richard Oastler, Wm Lovett and Henry Vincent (both working men), Ernest Jones, and Thomas Cooper. The *Northern Star* became the newspaper organ. Members of the extreme section favoured resort to arms, or popular risings and riots, if their demands could not be obtained by peaceable methods. This section of the C. were called physical-force men; but

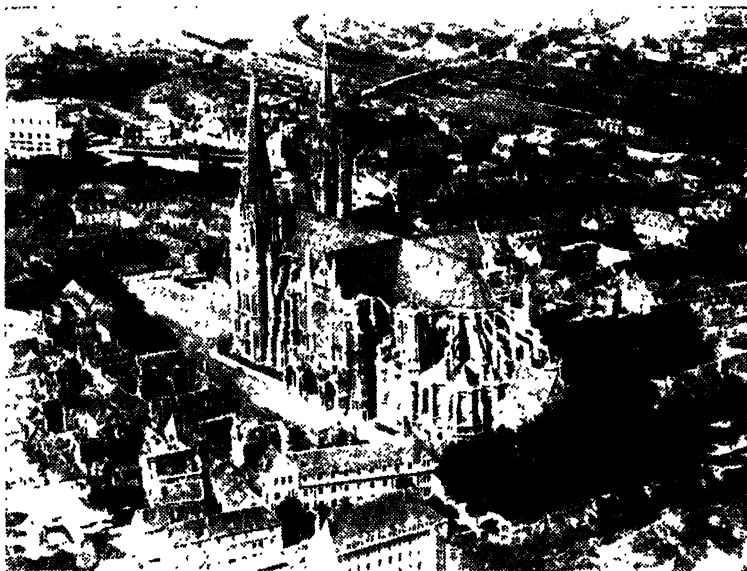
the more moderate C., who advocated only constitutional agitation, were in the majority. Their demands were adopted from earlier reformers, John Cartwright's (q.v.) *Plan of Reform*, 1776, and the Duke of Richmond's Bill, 1780, known as the People's Rights measure. The struggle of the C. may be divided into 2 periods—1836-9, aiming merely at industrial amelioration, and 1840-8, when the extremists gradually took over leadership, and the movement became more revolutionary and lost much moderate support. The C. refused to support the Anti-Corn Law League, as helping only the middle classes. Disturbances were most frequent in the N. Finally it was announced that a great demonstration was to be held on Kennington Common. The Gov. forbade the procession, and Wellington posted troops to guard London. But the demonstration and the Chartist petition were a failure. As a party the C. disappeared after 1849, the movement declining partly owing to improved conditions of labour, partly to the legislative concessions made in reform Bills, and partly to internal dissensions in the party itself. See M. Hovell, *The Chartist Movement*, 1920; J. L. and B. Hammond, *The Age of the Chartists, 1832-1854*, 1930; G. D. H. Cole, *Chartist Portraits*, 1941.

Chartres, Fr. city, cap. of the dept of Eure-et-Loir, and chief tn of Beauce (q.v.), on the Eure, 55 m. SW. of Paris. It was burnt by the Normans in 858, but withstood a Norman siege in 911. In 1417 it fell into the hands of the English, who lost it again, however, in 1432. In 1591 it was taken by Henry IV (q.v.), who was crowned in the city in 1594. During the Franco-Ger. war it was captured by the Germans and was an important centre of operations. It was again in Ger. hands in the Second World War; it fell to the troops of Gen. Patton (q.v.) on 17 Aug. 1944. C. is in 2 parts—the upper and the lower tns—which are connected by very steep roadways. C. is famed for its wonderful cathedral, Notre Dame, founded in the 11th cent. by Bishop Fulbert, which is regarded by many as the most perfect of the Gothic cathedrals of France. The main part of the structure was built in the years 1194 to 1225. There are fine rose-windows, doors, and statuary, and there are 2 magnificent spires, of which the *clocher vieux* dates from the years 1145-65, and the *clocher neuf* (the higher—371 ft.—and more richly designed spire) was begun in 1134 and completed in the 16th cent. C. has also other medieval churches and some fine old houses. There is an important grain market, and there are metal, wood, and tanning industries. Pop. 26,400. Its Rom. name was Autricum.

Chartreuse, La Grande, Carthusian monastery, founded in the year 1084 by St Bruno (q.v.). It is situated in a wild, picturesque valley in the Fr. dept of Isère, about 13 m. N. of Grenoble (q.v.). Its name was derived from a neighbouring vil. called *Carthusia*, now known as St-Pierre de C. The original monastery, built to the N. of the present site, was

ruined in an avalanche in 1132, and a new monastery was constructed on the spot occupied to-day. This second edifice was destroyed by fire in the 17th cent., and the present buildings date mainly from that time. The 4 halls were intended for the entertaining of the priors of other monasteries in France, Burgundy, Germany, and Italy. The chapel dates from the 15th cent. (though the vaults were rebuilt in the 17th cent), and the great cloister belongs to the 14th and 16th

first Republican governor of Ohio, which position he held from 1855 to 1859, but was unsuccessful as Republican candidate in the presidential election of 1860. From 1861 to 1864 he was secretary of the treasury, managing the country's finances with the greatest ability and credit during the years of the Civil war. The estab. of a national banking system and the issue of treasury notes ('greenbacks') were 2 of his most successful measures. In 1864 Lincoln appointed him chief justice of the



CHARTRES CATHEDRAL

E.N.A.

cents. The monks of C. had to leave the monastery in 1795, and did not return until 1816. They were expelled again in 1903, and reoccupied the monastery in 1940. The famous liqueur called C. is made by the monks; the proceeds from its sale are used for the upkeep of Carthusian monasteries, and in the maintenance of various charities. See CARTHUSIANS.

Chartreuse Liqueur, see LIQUEUR.

Charybdis, see SCYLLA AND CHARYBDIS.

Chase, John (1810-79), water-colour painter, b. London; was a pupil of Constable. One of his best-known works is of the interior of Westminster Abbey.

Chase, Salmon Portland (1808-73), Amer. lawyer and statesman, b. Cornish, New Hampshire. In 1830 he settled in Cincinnati where he won a great reputation as counsel for sev. fugitive slaves whose cause he enthusiastically upheld. On account of the question of slavery he left the Whig party in 1841. He was the

U.S. Supreme Court, in which capacity he presided at the trial of President Andrew Johnson, 1868. See A. B. Hart, *Salmon Portland Chase*, 1899, and J. W. Schuckers, *Life and Public Services of S. P. Chase*, 1874.

Chase, Samuel (1741-1811), Amer. jurist, b. Maryland; admitted to the Bar at Annapolis. Was a member of the Continental Congress and was sent with Franklin to win over Canada to the revolting colonies; he signed the Declaration of Independence and helped to draw up a constitution for Indiana. An ardent Federalist, he was made a justice of the Supreme Court. Impeached by the House of Representatives, 1804, the impeachment fell through. See *Trial of Samuel Chase* (Washington, 1805).

Chase, William Merritt (1849-1916), Amer. painter, b. Franklin, Indiana. He was a pupil of B. F. Hays of Indianapolis and of J. O. Eaton in New York, and

later of Piloty and A. Wagner in Munich. He taught painting in New York for some years. He was a most successful portrait painter, his pictures of Whistler, Duveneck, Gen. Webb, etc., being well known. He was president of the Society of Amer. Artists.

Chasing (Lat. *caelatura*; It. *ceselatura* Ger. *Ciselieren*; Fr. *ciselure*; signifying chiselling), the art of producing figure and various ornamental designs, which can be either raised or hollowed or metallic surfaces with steel implements. It is employed chiefly for the ornamentation of goldsmith and silversmith articles, electro-plate, etc., being used to create fittings and bosses; it is also used to imitate engraved surfaces. (See **GOLD-SMITH'S ART AND WORK**.) Very delicate results may be achieved by this method; the most perfect examples of which may be seen in the chasing on the watch-cases by G. M. Moser, 1704-83. The worker first outlines the design on the surface he wishes to ornament; then, should bold and high embossments be the desired effect, these are blocked out by a process called snarling. The snarling-iron is a long iron tool turned up at the end, and made so that when it is securely fixed in a vice, the end that is turned up can easily reach and press against any part of the inside of the article that is to be chased. The part of the article to be embossed is held firmly against the upturned end of the snarling-iron, then a strong blow is given by the worker at the opposite end of the iron, with the result that the point touching the object gives it the sudden stroke that is needed to throw up the surface of the metal just where it meets the tool. When the blocking-out process from the interior is accomplished, or when the process of C. instead of embossing is required, the object to be chased is filled with molten pitch, which is allowed to harden. It is then fastened to a sandbag, and all the details of the design—lined, smooth, or rough—are worked out by a hammer and sev. small punches of varying outlines.

Chasles, Michel (1793-1880), Fr. mathematician, b. Épernon, was prof. at the École Polytechnique and later at the Sorbonne. In 1867 he made a report to the Academy that he had obtained a number of letters of Pascal which proved that the latter had anticipated the discoveries of Isaac Newton. These letters, as well as thousands of others alleged to be of Dante, Shakespeare, and other famous men, were proved to be forgeries committed by one Vrain Lucas, who was duly convicted. In his chief work, *Aperçu historique*, etc., 1837, C. gives a brilliant account of the progress in modern times of geometrical methods. Other works are *Traité de géométrie supérieure*, 1852, and *Traité des sections coniques*, 1865, etc.

Chasles, Victor Euphémien Philarète (1798-1873), Fr. writer and critic, b. Mainvilliers near Chartres. C. was brought up in accordance with Rousseau's theory in *Émile*, and learned the printing trade. He was imprisoned for his share in a Jacobite plot, 1815, and on his release

went to England, where he worked for Valpy the printer and pub. critical articles in the reviews. On his return to France in 1826 he did much in introducing Eng., Russian, and Scandinavian literature. He was made librarian of the Bibliothèque Mazarin in 1837; and in 1841 he became prof. of comparative literature at the Collège de France. Some of his voluminous literary and critical works are pub. in *Trente Ans de critique*, 20 vols. of studies in comparative literature, 1846-75.

Chassé, David Hendrik, Baron (1765-1849), Dutch general. He served with the Fr. Army after 1793 and during the Peninsular war; in 1815 with the Dutch at Waterloo. In 1830 he was Governor of Antwerp and conducted a brave defence against the French. He was named by his soldiers 'Gen. Bayonet,' from his devotion to that weapon in attack.

Chasseloup-Laubat, François, Marquis de (1754-1833), Fr. officer of engineers. Was a divisional general under Napoleon in 1799, but later he went over to the Bourbons and was made a Fr. peer. Was an expert in fortifications and on warfare generally.

Chassepot, Antoine Alphonse (1833-95), Fr. inventor of the rifle known by his name. He was b. at Mutzig, and was a mechanic in the gov. arsenal. The Chassepot was a breech-loading rifle, calibre .433 in., muzzle velocity 1328 f./s., sighted to 1200 metres. It was adopted by the Fr. Army, 1866, and was most successful in the Franco-It. war, 1867. The Prussian needle-gun was matched against the Chassepot in the war of 1870. The Gras rifle replaced the Chassepot in 1874. C. received the cross of the Legion of Honour.

Chassériau, Théodore (1819-56), Fr. painter, b. Samana, Santo Domingo. He was a pupil of Ingres, and subsequently studied in Rome. He was influenced by Delacroix. His 'Tepidarium at Pompeii' is in the Louvre. His frescoes at the Cour des Comptes, Paris, were partly ruined in the Paris Commune. His reputation rests on his excellent portraits. See L. Bénédite, *Th. Chassériau, Sa vie, son œuvre*, 1931.

Chasseurs (Fr. 'huntsmen,' cf. Ger. *Jäger*). In the 18th cent. the name was given to soldiers who formed a light company of skirmishers attached to a regiment; in the modern Fr. Army it is used of a class of light regiments capable of rapid movement. They are both mounted (*C. à cheval*) and on foot (*C. à pied*). The 3. d'Afrique, first organised in 1831 and stationed in Algeria, are famous for their speed and endurance, and for their Arab horses. The C. Alpains are regiments of infantry stationed on the S.E. frontier of France, and are trained to cover 37½ m. of ground in a day in full marching order. In the 7 months of snow they are trained to use skis and snow-shoes.

Chassidim, religious sect, zealous defenders of the unity of the Deity and the belief of their ancestors, who opposed Antiochus Epiphanes (175-164 BC) and his

successors when they endeavoured to put aside the Jewish religion and to introduce idolatry. Their leader was Mattathias, who killed the commander of the tyrants at the idolatrous altar in Modeln, near Joppa. The name C. was given by later Jews to those persons who devoted their lives entirely to religious exercises and bodily chastisements, to expiate their own sins, or those of others, or to hasten the coming of the Messiah. They studied the Cabbalah (q.v.), fasted, and by mortifying the flesh thought to free the spirit from the body, and so to enter into communion with God and angels. About the middle of the 18th cent. a new sect of C. arose, who held the belief that communion of man with God was effected by contemplation and prayer. This sect increased in number; some were considered representatives of God and their works were regarded as oracles. At first viewed with suspicion, and even excommunicated, by the orthodox majority, the C. were later tolerated and accepted as a permanent feature of Judaism.

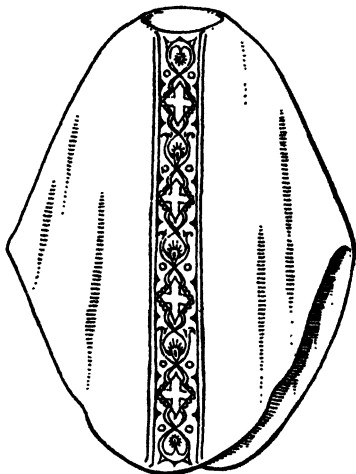
Chastelard, Pierre de Boscosel de (1540-1563), Fr. poet, b. Dauphiné. He was a descendant of the family of the Chevalier Bayard, and became a page in the household of the Constable Montmorency and of Marshal Damville. In 1561 he accompanied the latter to Scotland in the suite of Mary Queen of Scots, with whom he fell violently in love. Entering the queen's service, he wrote passionate poems to her, and if she did not encourage him, she at least accepted his verses. He was found under her bed by her maids of honour, but was forgiven. A second offence was unpardonable, and he was hanged. According to Brantôme he went to his death reciting Ronsard's hymn to death. His last words, addressed to the queen in Holyrood, 'Adieu, toi si belle et si cruelle, qui me tues et qui je ne puis cesser d'aimer,' have often been quoted. He is the subject of Swinburne's *Chastelard* (1865) the first of his Scottish trilogy written after the Elizabethan model.

Chastellain, Georges (c. 1404-75), Fr. poet and chronicler, b. Alost, Flanders. He was in the service of the Dukes of Burgundy, and celebrated as the author of the *Grande Chronique des ducs de Bourgogne*, and similar chronicles. He also wrote a number of epitaphs, rondeaux, and ballads, and was considered as the head of the *rhétoriqueurs*. See K. Urwin, *Georges Chastellain*, 1937.

Chastellux, François Jean (1734-88), Fr. author and general, b. Paris. He served with honour during the Seven Years War, and fought in the Amer. War of Independence. His best-known works were *De la félicité publique*, 1772, and *Voyages dans l'Amérique septentrionale*, 1788. He was elected to the Fr. Academy in 1775.

Chasuble, eccles. vestment, worn by W. bishops and priests during the celebration of mass, formerly known as *planeta*. Essentially it is a round of cloth with a hole in the centre for the head, but its shape has been modified and revised from age to age. The C. was formerly plain, but it is now frequently embroidered

and adorned with orphreys. It should be of silk. The C. owes its origin to the Rom. *paenula*, a cloak worn by both sexes and all classes. It had no special significance in early Church use, and it was first definitely reserved as a eucharistic vestment in the 11th cent., and formally assigned to the celebrating priest at the mass in the 13th cent. It was retained at the Reformation by the Lutherans, and is authorised in the Church of England Prayer Book by the Ornaments rubric. See G. Dix, *The Shape of the Liturgy*, 1945.



CHASUBLE

Chat, popular name for certain birds of the family Turdidæ, such as the stonechat, *Saxicola torquata* and the whinchat, *S. rubetra*.

Chat Moss, peat bog in Lancs, England. It lies between Manchester and Liverpool, and stretches over about 6000 ac. One of the finest feats of engineering accomplished by George Stephenson was the railway that he built across it (1828-30). Many attempts have been made to drain it, works being constructed for the purpose by Roscoe in 1805, and by Edward Baines in 1821; the greater part of it is now cultivated.

Chata, or *Pterocles alchata*, representative member of the Pteroclidæ, or sandgrouse family. It is a desert bird living in S. Europe, Africa, and Asia, and is considered to be good eating.

Chatalja, see CATALCA.

Château, Fr. word (from Lat. *castellum*, fortress) for a castle (q.v.). During the late 15th and 16th cents., when houses began to be built for residence only and not as castles for defensive purposes, the term became applied to all large country houses. The fortified castle was termed

C. fort, and the residence *C. de plaisance*; the latter often retained some, at least, of the architectural features, *tournelles*, etc., of the medieval castle of defence.



Belgian Embassy

WALZIN: THE CHATEAU

Château, term which, when applied to wine, more especially in Bordeaux, implies that the wine so labelled is produced every year from the same vineyards. Château-bottling is a guarantee of authenticity, though the name of a good wine merchant is equally trustworthy.

Château Gaillard, ruined Fr. fortress on the Seine, not far from Les Andelys. Built at the close of the 12th cent. by Richard Cœur de Lion to defend the dukedom of Normandy against the Fr. king. Captured by Philippe Auguste in 1204.

Château-Gontier, tn in the dept of Mayenne, France. There are chalybeate springs near by. There is an agric. market, and some textile manufs. Pop. 6300.

Château-Grillet, *see* RHÔNE WINES.

Château-Renault, François Louis de Rousselet, Marquis de (1637-1716), Fr. vice-admiral, who fought at the battle of the Dunes, and, with Turenne, at the siege of Dunkirk. Fought the Levantine corsairs and captured a number of their vessels. Was made Governor of Brittany and a Marshal of France. Became Baron of Poullmic and Vicomte of Artois.

Château-Salins, Fr. tn, cap. of an arron., in the dept of Moselle. The anct château of the Bishops of Metz is here. It has salt and soda works. Pop. 1600.

Château-Thierry, Fr. tn, cap. of an arron., in the dept of Aisne, on the Marne. Napoleon defeated the Prussians and the Russians near here in 1814. During the First World War it was the scene of fierce fighting—in 1914, during the Ger. advance on Paris, when it was for a time in Ger. hands, and again in 1918, when it was taken by the Germans during their final advance. It was severely damaged during the Second World War. La Fontaine (q.v.) was b. here in 1621. Chemicals, crockery, and mathematical and musical instruments are manuf. Pop. 8000.

Châteaubriant, François René, Vicomte de (1768-1848), Fr. writer, b. St Malo, and after a somewhat unhappy childhood, entered the regiment of Navarre. In 1791, inspired by a desire for adventure and the natural life, he went to America, but was recalled by the news of the arrest of Louis XVI. He married immediately on his return, and then joined the ranks of the 'émigrants.' After being wounded at the siege of Thionville, he lived in England till 1800, earning his livelihood by giving Fr. lessons. In 1797 he pub. his *Essai sur les révolutions*, a confused work marked by much ill-digested learning. It is sceptical and despairing, and its very uneasiness prepares one for the conversion which the deaths of his mother and sister brought about. This conversion led to his great apology for Christianity in poetry. In 1801 he pub. *Atala*, an episode detached from the greater work, *Le Génie du christianisme*. It showed a new, daring, and brilliant writer, a reformer both in prose and in poetry. In 1802 appeared *Le Génie du christianisme*. C. does not attempt directly to prove that Christianity is true, but that it is beautiful, and that it is capable of inspiring far higher poetry than is the pagan mythology. His romanticism appears in a more concentrated form in *René*, 1805, another episode detached from the main work, the first expression of 'mal du siècle.' On his return to France, C. received an appointment under Napoleon, and in 1809 pub. *Les Martyrs*, which contains the argument of *Le Génie du christianisme* cast in an objective form. Two years later he pub. *L'Itinéraire de Paris à Jérusalem*, after a pilgrimage to the latter tn. Of even greater influence was his *Mémoires d'Outre-Tombe*, 1848-50, an account, often purely imaginary, of his own life. C. is, with Mme de Staël, the leader of the Romantic movement of the early 19th cent. He reformed poetry, hist., the novel, and in addition to this he was one of the greatest masters of Fr. prose. *See* C. A. Sainte-Beuve, *Châteaubriant et son groupe littéraire sous l'Empire*, 1860; E. Faguet, *Le XIX. Siècle*, 1887; M. H. Miller, *Châteaubriant and English Literature*, 1925; A. Maurois, *Châteaubriant*, 1938; M. Levaillant, *Splendeurs et misères de Châteaubriant*, 1948.

Châteaubriant, tn in the dept of Loire-Inférieure, France, situated on the R.

Chère. Parts of the 11th-cent. castle, after which it is named, still remain. There are foundries, and the manuf. of leather goods and agric. machinery is carried on. There was a Ger. concentration camp here during the Second World War. Pop. 9,300.

Châteaudun, Fr. tn, cap. of an arron., in the dept of Eure-et-Loir, overlooking the Loir. It was known to the Romans, and was destroyed by the Normans in 875. There is a remarkable château, partly 12th-cent., and 2 fine churches, both also partly 12th-cent. C. was burnt by the Germans in 1870 after a heroic defence (see FRANCO-GERMAN WAR). It bears the Legion of Honour in its arms. It is a mkt tn. Pop. 8,100.

Châteaulin, tn in the dept of Finistère, France, on the R. Aulne. It has an agric. market. Pop. 4,000.

Châteauneuf-du-Pape, see LUÏÏONE WINES.

Châteauroux, Fr. tn, cap. of the dept of Indre, on the Indre. It is named from a 10th-cent. château built by Raoul of Déols; the present château is 15th cent. There are 2 more churches, and a museum of relics of Napoleon and Gen. Bertrand (q.v.), who d. here. It is a railway junction, and manufs. textiles, agric. machinery, and furniture. Pop. 34,600. See also DÉOLS.

Chatel, Ferdinand Toussaint François (1795–1857), b. Gannat, Allier, a religious fanatic who apostatised from the Catholic Church to found the Gallic Church. He denounced celibacy and confession, and wrote many religious essays.

Châtelet, tn in the prov. of Hainaut, Belgium, on the R. Sambre, 3 m. E. of Charleroi. It is a mining centre, and manufs. explosives. Pop. 15,200.

Châtelet, Le Grand, old fortress on the r. b. of the Seine in Paris, on the site now occupied by the Place du C. The first mention of it is in a charter of Louis le Jeune, 1147. It was the city prison in the time of the Renaissance, and a court of justice, but was destroyed in 1802. Le Petit C., a smaller fortress on the opposite bank of the riv., also used as a prison, was destroyed in 1782.

Châtelet-Lomont, Gabrielle Emilie le Tonnelier de Breteuil, Marquise du, see VOLTAIRE.

Châtelineau, tn in the prov. of Hainaut, Belgium, situated on the R. Sambre, 3 m. E. of Charleroi; it is a mining tn with big coalfields and iron works. Pop. 20,100.

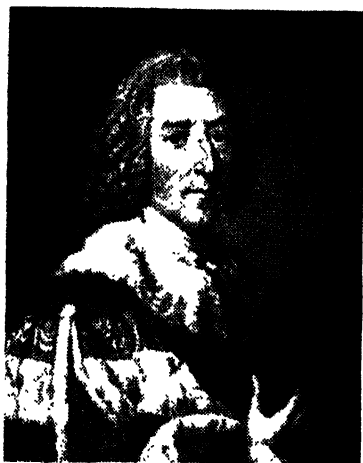
Châtelleraut, Fr. tn, cap. of an arron., in the dept of Vienne, on the Vienne. It manufs. small arms, cutlery, and preserves, and has a distillery. Pop. 22,800.

Chatfield, Sir Alfred Ernle Montacute Chatfield, 1st Baron (1873–), admiral, son of Adm. A. J. C. Entered the navy, 1886; captain, 1909; rear-admiral, 1920; vice-admiral, 1926; admiral of the fleet, 1935. Served as flag-captain to Beatty, H.M.S. *Iron*, in action off Heligoland, 1914; Dogger Bank, 1915; battle of Jutland, 1916. Fourth sea lord, 1919; assistant chief of naval staff, 1920–2; commanded light cruiser squadron, 1923–4; third sea lord and controller of the navy, 1925–8;

commander-in-chief of Atlantic fleet, 1929–30, of Mediterranean fleet, 1930–2; first sea lord and chief of the naval staff, 1933–8; chairman of expert committee on Indian defence, 1938–9; minister for co-ordination of defence, 1939–40, with seat in the War Cabinet. K.C.B., 1922; G.C.B., 1934; O.M., 1939. In the inter-world-war decades he held key posts which placed him in a position to warn the gov. and the people of the risk that the country might once again find itself facing a world war without being prepared. As assistant chief of the naval staff he attended the Washington Conference of 1921–2 as expert adviser to the Brit. delegation, being instrumental in securing such concessions on battleship tonnage as enabled the Admiralty to build 2 new 16-in. gun ships. As controller of the navy he served at a time when the efficiency of the navy was dangerously impaired by false economy. When, in 1933, C. was once more appointed to the Admiralty, he aimed at 3 objectives: to rebuild the battle fleet; to increase Brit. cruiser strength to a minimum of 70; and to free the Fleet Air Arm (q.v.) from Air Ministry control; and generally he was successful. As chief of the naval staff he set as the basic aim the unity of the 3 services and, through that unity, the strengthening of the chiefs of staff committee in their task of rebuilding the fighting services, which, by 1933, had been reduced to 'such a serious state of unreadiness for war.' C. succeeded Lord Caldecote (then Sir Thomas Lusk) as minister for the co-ordination of defence, with a seat in the Cabinet, the appointment being hailed with enthusiasm by public opinion. As deputy chairman of the committee of imperial defence (q.v.) he deputised for the Prime Minister on all ordinary occasions. He was raised to the peerage in 1937. Pubs.: *The Navy and Defence, 1942; Defence after the War, 1944; It Might Happen Again* (written in 1940, pub. 1947) (autobiographical).

Chatham, William Pitt, 1st Earl of (1708–78), statesman, b. Westminster, and educ. at Eton and Trinity College, Oxford. Early in 1731 he was gazetted cornet in Lord Cobham's Horse. Four years later he entered Parliament as member for the family bor. of Old Sarum. He supported the opposition, and for a speech made on the marriage of Frederick, Prince of Wales, which the king found offensive, he was dismissed from the army (1736). Shortly afterwards the prince rewarded his supporter by making him one of his grooms of the bedchamber. Pitt soon took an active part in the debates of the House of Commons, and his great powers of oratory quickly gained him a great reputation. He had, however, to struggle against the king's dislike, which blocked his political progress for a long time. Under Pelham he was appointed early in 1746 joint vice-treasurer of Ireland, but in May of the same year he was promoted to the position of paymaster-general of the forces. This was the most lucrative office in the ministry, owing to the numerous and valuable perquisites attaching thereto; but Pitt, setting an example unusual in

his age, declined to accept anything but the actual salary. On Pelham's death, Pitt had hoped to lead the House of Commons, and, disappointed in his ambition, he attacked the new leader, Sir Thomas Robinson, and the new Prime Minister, the Duke of Newcastle. He was dismissed late in 1755, but a year later he was invited to form an administration. In April 1757, dismissed by the king, whose dislike of him was even stronger than before, he was, after a few weeks, recalled to power, and held office (under the nominal leadership of the Duke of Newcastle, though he himself was the dominating member of the gov.) until Oct. 1761.



EARL OF CHATHAM

Engraving after a picture by Richard Brompton.

It was during this period that he was able to give the fullest proofs of his ability as a war minister, for he had returned with full powers to direct the war and to take charge of foreign affairs. His efforts were to secure Britain her N. Amer. Empire, and to raise Brit. prestige to a level unknown for a hundred years. He declined office in 1763, but continued to take as active a part in debate as his health would allow. When Rockingham was dismissed in July 1766, Pitt was invited to form another administration, but he was not well enough to do more than take the sinecure office of Lord Privy Seal in his own ministry. This necessitated his accepting a peerage—a step that made him for a time very unpopular. The city especially resented the 'Great Commoner' becoming the Earl of C., and actually cancelled a banquet that was to have been given in his honour. His health now completely gave way, and he resigned the office of Prime Minister in Dec. 1767 to the

Duke of Grafton, holding, however, that of Lord Privy Seal until the Oct. of the following year. He was taken ill while making a vigorous speech in the House of Lords against the acknowledgment of Amer. independence (albeit he had never approved the war) in 1778, *d.* shortly afterwards, and was buried in Westminster Abbey. C. is one of the greatest figures among Eng. statesmen, and was an outstanding parl. orator. He combined great administrative ability with an integrity of character not often found in politicians of the day. See lives by Lord Macaulay, 1851, B. Williams, 1914, and B. Tunstall, 1939. See also Sir C. Grant Robertson, *Chatham and the British Empire*, 1946.

Chatham, riv.-port tn in Kent, England, on the r. b. of the Medway, and joined on the W. side by Rochester and the E. by Gillingham. The tn possesses very few objects of interest, and owes most of its importance to its military fortifications and dockyards. It is one of the most celebrated shipbuilding centres in England, the length of the dockyards being nearly 2 m., which contain sev. building slips and wet docks, the latter capable of holding the largest ships. In the Middle Ages C. was merely a suburb of Rochester, but Henry VIII, to whom we owe the foundation of a regular navy, ~~ab.~~ dockyards, and the natural harbour formed by the deep channel of the riv. was made use of by Elizabeth I, who built a dockyard and an arsenal here. The defences of C. constitute a fortification of great strength, and are a great protection to London should invaders succeed in landing on the S. coast, in order to march on the cap. Fort Pitt, rising above the tn to the W., built in 1779, is now a girls' technical school. Almshouses built in 1592 by Sir John Hawkins for disabled seamen, have since those days been entirely rebuilt. At one time traces of old Rom. remains were discovered in the form of weapons, Rom. bricks, and tiles; also human remains. The modern church of St Mary's, opened in 1903, stands on the site of an old Saxon church. There is also St Bartholomew's Chapel, which was formerly attached to the hospital for lepers, one of the first founded in England, by Gundulph, Bishop of Rochester, 1070, partly of Norman architecture. Pop. 52,000. With Rochester C. forms a parl. bor. returning 1 member.

Chatham, co. tn of Kent co., Ontario, Canada, on the Thames R. 12 m. from its mouth, 64 m. SW. of London and 180 m. W. of Toronto. Connected with Detroit and the cities on Lakes Huron and Erie by steamboat service. It is the centre of a large natural gas field, and has also cheap hydro-electric power. The chief industrial products are motor cars, pumping and well machinery, textiles, malleable steel, flour, lumber, sugar, cigars, furnaces, gloves, and fertilisers. The crops of the co. are husking corn, tobacco, tomatoes, and soy-beans. C. has 2 large parks and 4 more on the nearby lakes. There are 2 business colleges, a new collegiate institute or senior high school, and a

vocational school; also there are 2 hospitals. The community was first surveyed in 1794 by Governor Simcoe, as a naval shipyard; hence its name. It became a city in 1895. It was famous in pre-Amer. civil war days as the N. terminus of the 'underground railway' for escaped Negro slaves. Pop. 22,720.

Chatham, tn and port in Northumberland co., New Brunswick, Canada, on the Miramichi R., 24 m. from its mouth. Extensive fisheries are carried on, also a trade in lumber; it is the site of a large Royal Canadian Air Force training station. Pop. 5225.

Chatham Chest, charitable fund originated by Sir Francis Drake and Sir John Hawkins in 1588 to assist sick and wounded seamen. It takes its name from the money having been placed in a chest kept at Chatham that had 5 locks, the keys of which were held by the officers who had charge of it. Four supervisors and 7 directors were appointed to look after the accounts, which had to be placed before Parliament every year. Twelve ac. of land were assigned to the charity by Charles II, and the fines imposed by the courts martial were also handed over to it in 1688. In 1802 the chest was moved to Greenwich and the fund incorporated with Greenwich Hospital; up till 1829 a considerable part of the money was raised by deductions from seamen's pay.

Chatham Islands, small group of is., including some rocky islets, in the Pacific Ocean, lying 360 m. E. of New Zealand, to which they belong. These is. were discovered in 1791 by Lieut. W. R. Broughton, who named them after the boat which he was commanding at the time of the discovery. The natives he called Morioris, after the name which the New Zealand natives gave themselves (*see* MAORI), and their dress consisted of sealskins or mats. In 1831 they were conquered by 800 Maoris from New Zealand, and in 1849 there were only 90 survivors out of a total pop. of 1200, the race being therefore all but exterminated. The chief export of the is. is wool, and the industries comprise cattle- and sheep-breeding, and seal-fishing. The climate is colder than that of New Zealand, while the soil is extremely fertile, with luxuriant growth of fern and flax. Area 372 sq. m.; pop. 533.

Châtillon-sur-Seine, Fr. tn in the dept of Côte-d'Or, on both banks of the Seine, near the forest of C. It has many anc. buildings of interest. There are quarries, metal industries, and an agric. market. Pop. 4200.

Chatou, Fr. tn in the dept of Seine-et-Oise, on the Seine, 8 m. from Paris. Pop. 12,800.

Chatsworth, vil. in Derbyshire, England, containing the famous seat of the dukes of Devonshire. The original C. House was commenced by Sir Wm Cavendish (d. 1557) and completed by his widow. It was in this building that Mary Queen of Scots was imprisoned under the care of the Earl of Shrewsbury. Later it was pulled down and the present house was built in 1688 by Wm, 1st Duke of

Devonshire. It is a quadrangular building with an open courtyard in the centre, and Ionic in style, standing on the l. b. of the R. Derwent about 2½ m. from Bakewell. The magnificent gardens with the vast conservatory and numerous fountains were designed by Sir Joseph Paxton. The house contains priceless collections of pictures and statuary, and some very beautiful wood carving.

Chattahoochee, riv. in Georgia, U.S.A., forming part of the boundary on the W., and joining the Flint, after which it becomes the Apalachicola. It is navigable for about 200 m., up to Columbus, the total length being 436 m.

Chattanooga, cap. of Hamilton co., Tennessee, U.S.A., on the Tennessee R. It is important as a commercial and railway centre, doing a large trade in lumber, grain, and coal, and manufacturing iron, steel, machinery, etc. It is famous for the battle fought there during the Amer. Civil War, which consisted of a series of engagements including that of Chickamauga, that of Lookout Mt. known as the 'battle above the clouds,' and that of Missionary Ridge, when the Federals under Grant defeated the Confederates under Bragg, 23-5 Nov. 1863. The national cemetery to the E. of the city contains the graves of over 13,000 Federal soldiers. The city contains some fine buildings, and possesses a univ. known until June 1907 as the Grant Univ. This, the univ. of C. (Methodist Episcopal), was founded in 1867 and now comprises schools of law, medicine, and theology. It has about 2900 students. Pop. 131,040.

Chattels (O.F. *chatel* from Low or late Lat. *capitale*, Lat. *capitale*, 'property,' as also 'cattle,' which is essentially the same word as chattel, but the latter is much more modern). The phrase goods and C. in Eng. law means all property not included under one or other of the terms 'lands, tenements, and hereditaments' (q.v.), and is thus the equivalent of personalty. This property is divided into C.-real and C.-personal. The former include any estate or interest in lands or buildings which does not amount to a freehold, because it is a fundamental principle of Eng. real property law that a lease or tenancy for a term of years of any length is classified as personal property, and descends as such on intestacy. The latter are either corporeal, i.e. having an actual physical existence, such as money, plate, furniture, and minerals when severed from the land; or incorporeal, i.e. having a mere notional existence, such as debts, patents, stocks and shares, and copyrights.

Chatterer, in ornithology, is a word that has been applied in a loose sense to many birds without special regard to its applicability. It is often used particularly for *Ampelis garrulus*, the waxwing, but is frequently used for other passeriform birds which are members of the family Cotingidae.

Chatteris, mrkt tn in Cambs, England, situated in the administrative co. of the Isle of Ely. A thousand Rom. coins of

305-6 and part of the skeleton of an elephant have been found here. There is the site of a Benedictine convent of the 10th cent, and axe heads of the Stone and Bronze Ages and a Rom. quern have been found and are in the council's museum. Pop. (1953) 5528.

Chatterton, Edward Keble (1878-1945), author and journalist, b. Sheffield and educ. at Oxford. Entered journalism in London in 1902 and, for a time, took up art criticism, publishing *T. Sydney Cooper, R.A.*, 1903, and *Modern Journalism*, 1909. But he was chiefly known as a copious writer on ships and the sea. His book *Sailing Ships: the Story of their Development from Earliest Times to the Present Day* appeared in 1909, *Steamships and their Story* in 1910, and also in 1910 *Down Channel in 'Vivelle'*, on his yachting experiences. Other books were *The Story of the British Navy*, 1911, *King's Cutters and Smugglers*, 1912, and, after an interval of employment in the historical section of the committee of imperial defence, *Q-Ships and their Story*, 1922, *The Epic of Dunkirk*, 1940, and *Beating the U-Boats*, 1943.

Chatterton, Thomas (1752-70), poet, b. Bristol, the son of a poor schoolmaster. He is said to have been a dull child, but after he entered Colston's Hospital at Bristol at the age of 8, he began to draw, and became an omnivorous reader, his tastes inclining to poetry. At the age of 12 he wrote a poem, *Elinoure and Juga*, on old parchment and with obsolete spelling, which deceived the junior usher of the school, Thomas Phillips, who was convinced of its antiquity. Thus encouraged, he continued what was to him a delightful game, and forged a pedigree of the De Berghams, which was accepted by their descendant, a pewterer named Henry Burgum. In 1767 he was apprenticed to an attorney at Bristol, and in the following year hoaxed that whole city with a description, alleged to be from an old MS., of the opening of Bristol Bridge in 1248. He now carried the joke further. He sent to Horace Walpole a 'transcript' of *The Rysc of Peyncteynge yn Englande*, written by T. Rowleie, 1469, for Maistre Canynge. Walpole was deceived, and had some thought of printing it at his own press, but before doing so showed it to Gray and Mason, who pronounced it a forgery, whereupon Walpole returned the MS. to the lad. C. came to London in 1770, and, living in a garret, wrote many verses, including the *Exceleste Balade of Charitie*. He seemed to have a fair prospect of making his way, for Alderman Beckford became his patron; but Beckford d. on 21 June, and he could find no publisher or editor to employ him. Rendered desperate by his penniless condition, on 24 Aug. he poisoned himself with arsenic. That C. should have d. at the age of 18 is one of the crying pities of literature, for the *Balade of Charitie* shows great poetic power. The Rowley controversy survived the author's death, but the question of authenticity was definitely settled by Prof. W. W. Skeat in his ed. of Chatterton's works, 1875. See

D. Wilson, *Chatterton*, 1869; J. H. Ingram, *The True Chatterton*, 1910; E. H. W. Meyerstein, *A Life of Thomas Chatterton*, 1930; J. C. Nevill, *Thomas Chatterton*, 1948.

Chatto, Andrew, see HOTTEN, J. C.

Chaucer, Geoffrey (c. 1340-1400), poet, b. Thames Street, London, the son of a vintner. At about 16 years of age he became page to Elizabeth, the wife of Lionel, Duke of Clarence, and continued at court till 1359, when he joined the army which invaded France under Edward III. He was made prisoner, but ransomed some months before the treaty of Bretigny in 1360. Nothing is known



An engraving after the 'Occleve' portrait.

of the next 6 years of his life, but in 1368-72 he was again connected with the court, being at one time a valet of the king's household. At the death of his patron, Prince Lionel, in 1368, his services were transferred to John of Gaunt, Duke of Lancaster. It was at this time that he first began to write. For the next 12 or 14 years C. was constantly employed as a foreign diplomatic agent. During 1372-3 he was in Italy, first visiting Genoa on a commercial mission, and later Pisa and Florence. On his return he was rewarded by the grant of sev. privileges, including, in 1374, the office of comptroller of the customs and subsidy of wools, skins, and leather for the Port of London. In 1375 he received the custody of the lands and person of Edmond Staplegato of Kent, and in 1376 was employed upon a secret mission in conjunction with Sir John Burley. During 1377 he went to Flanders, and later to France, to treat for peace with Charles V; in 1378 to France and Lombardy; in 1382 was appointed comptroller of the petty customs. He became a justice of the peace in Kent in

1385, and in 1386 became member of Parliament and a knight of the shire for Kent. Later in the year he was reduced to comparative poverty by being removed from both his offices of comptroller, apparently at the instigation of Thomas, Duke of Gloucester. In 1387 he lost his wife, Philippa, and in 1389, on the return of his patron, John of Gaunt, from an absence abroad, was appointed clerk of the works at the palace of Westminster and the Tower of London. In 1390 he superintended works at St George's Chapel, Windsor, at Woolwich, and at Smithfield, but in 1391 lost his position. In 1394 Richard II granted him a new pension of £20, and in 1398 a yearly tun of wine; and in 1399 Henry IV promised him an additional pension of 40 marks. He d. on 25 Oct. 1400, in a house he had recently rented in the grounds of St Mary's Chapel, Westminster, and was buried in St Benet's Chapel (now Poets' Corner) in Westminster Abbey.

The works of C. fall into 3 periods, named, from the main influences exhibited in them, respectively French, Italian, and English. During his life at court, previous to 1372, his work was entirely imitative, and based on the popular Fr. poems which would be the natural models of a young poet of the time. He himself tells us that he made a translation of the famous romance, *Le Roman de la Rose*, but of this all trace has been lost except 3 fragments of doubtful authenticity except, perhaps, the first. Probably his earliest poem which remains to us is the *A B C*, a prayer rendered out of French at the request of Blanche, Duchess of Lancaster. To this period also belong the *Complaint to Pite*, a poem of rejected love, possibly autobiographical, and *The Deth of Blanche the Duchesse*, written in 1369, to commemorate the death, at the age of 25, of the wife of his patron, John of Gaunt. The second, or It., period (1372-84) is marked throughout by a love and knowledge of It. poetry, gained during his first mission to that country. Fr. romance was thrown over as he came to learn more of the full range and power of poetry, and the work of this time shows an enormous advance in form, simplicity, and directness of diction, humour, and, above all, the art of telling a story. Parts of sev. of the *Canterbury Tales*, such as the Second Nonnes tale, the Clerkes tale, the Knightes tale, the Man of Lawes tale, the Monkes tale, the Doctors tale, the tales of the Prioresse, Squire, Franklin, and the rhyme of Sir Thopas, were probably composed during this period, but the most important complete poem produced under It. influence was *Troilus and Creseide* (c. 1382), a very free trans., with many additions, of Boccaccio's *Filostato*. The additions are excellent and full of originality, and while the passionate description of the ruined love of Troilus and Cressida may be reminiscent of the *Complaint to Pite*, the character of Pandarus foreshadows the humour of the *Canterbury Tales*. Other poems of this period are the *Complaint of Mars*; *Anelida and Arcite*; *The Former Age*, mainly taken from

Boethius; the *Wordes to Adam*; the *Parlement of Foules*, full of delightful humour; and the *House of Fame*, an unfinished poem, showing the influence of Dante. The prose trans. of Boethius was also written at this time.

The third, or Eng. period, beginning about 1384, shows C. an entirely original poet except in the subject-matter of his work, and establishes his claim to be called the father of Eng. poetry. Between 1386 and 1389 he composed many of the most characteristic of the *Canterbury Tales* and the *Prologue*, revised and completed earlier tales, and consolidated the whole work. He also wrote the *Legende of Good Women*, 1385-6, which was left unfinished; the *Treatise on the Astrolabe*, 1391, compiled mainly from Messahala, for his little son Lewis, and left unfinished; the *Complaint to his Purse*; and sev. minor poems of doubtful date, such as *Truth*. The *Canterbury Tales*, upon which C.'s fame chiefly rests, owe their plan to the *Decameron* of Boccaccio, in which stories are told by a band of fashionable ladies and gentlemen who had retired to a garden outside Florence to escape the plague. C. transposes the idea to contemporary Eng. life by making the tellers of his tales members of a party of pilgrims on the road from Southwark to the shrine of Thomas à Becket at Canterbury. The pilgrims include men and women of every rank of social life, and represent the Church, the army, the court, law, medicine, trade, the sea, and the kitchen. The plots of their tales come from various sources. Many are foreign in origin, but much skill is shown in assigning these to suitable characters and bringing them into harmony with the general scheme by adaptation and addition. Many, such as the tales of the Miller, the Reeve, the Cook, the Wife of Bath (prologue), the Merchant, the Friar, the Nun's Priest, and the preamble of the Pardoner, are typically English, shrewd, good-tempered, inclined to be boisterous and full of a humour, which, if at times too broad for modern taste, is frank, hearty, and healthy. Among the numerous eds. of C.'s works may be mentioned those of John Stow, 1561, W. W. Skeat, 1894-7 and 1895, and F. N. Robinson, 1933. Bibliographies have been pub. by E. P. Hammond, 1908, D. D. Griffith, 1926, and W. E. Martin, 1935. See also W. Godwin, *A Life of Geoffrey Chaucer*, 1803; G. G. Coulton, *Chaucer and his England*, 1908; E. Legouis, *Geoffrey Chaucer*, 1910 (revised ed. 1934); G. L. Kittredge, *Chaucer and his Poetry*, 1914; G. K. Chesterton, *Chaucer*, 1932; J. L. Lowes, *Geoffrey Chaucer*, 1934; H. S. Bennett, *Chaucer and the Fifteenth Century*, 1947; N. Coghill, *The Poet Chaucer*, 1949; R. Preston, *Chaucer*, 1952; J. S. P. Tatlock and A. G. Kennedy, *A Concordance to the Complete Works of Geoffrey Chaucer and to the Roman of the Rose*, 1927.

Chaucer, Thomas (c. 1367-1434), statesman, possibly son of Geoffrey C. (q.v.). He had large estates in Oxon., which he represented in numerous parliaments. In 1407, 1410, 1411, and 1414 he was Speaker

of the House of Commons. He served on sev. diplomatic missions, and in 1424 became a member of the council.

Chaucer Society, The, founded in London (1867) by F. J. Furnivall with the aim of supplying scholars with MSS. and early texts relating to Chaucer not accessible to the public generally, and of facilitating Chaucerian research, and encouraging knowledge of his works by all. Furnivall issued in 1868 a six-text print of the *Canterbury Tales* for the society, and an index of proper names and subjects has been prepared by it (1911).

Chauci, Ger. tribe, mentioned by Tacitus as a people of great nobility, who lived in the dist. stretching between the R.s Elbe and Ems.

Chaudesaigues, Fr. spa in the dept of Cantal. Its hot mineral springs were known to the Romans. Pop. 1200.

Chaudet, Antoine Denis (1763-1810), Fr. sculptor, b. Paris. After obtaining the Grand Prix he left his bp. and went to Rome in 1784; here, influenced by the enthusiasm which prevailed in those days for the antique under Canova, he wrought his most famous works, 'Love,' 'Peace,' 'Paul and Virginia,' all of which are in the Louvre; 'Oedipus' and the bas-relief 'Fine Arts' being in the Musée Napoléon. He produced also a bust of Napoleon.

Chaudfontaine, Belgian vil. charmingly situated on a hill above the R. Vesdre, 5 m. SE. of Liège. It possesses hot mineral springs. Pop. 2000.

Chaudière, riv. and lake in Quebec, Canada. The riv. rises in the vicinity of Maine, U.S.A., flows into Lake Megantic, and from thence travels in a NW. direction to join the St. Lawrence R., 7 m. distant from the city of Quebec. The C. Falls occur about 2½ m. from its mouth. The lake is 18 m. in length, and 5 m. in width. The R. Ottawa flows through it, and the lake has its termination at its E. end in the Great and Little C. Falls, close to which lies the city of Ottawa.

Chaud-medley, see CHANCE-MEDLEY.

Chau-doc, prov. of Cochín-China (q.v.), on r. b. of Bassac R. The country is mountainous in the SW. but flat in the remainder of the prov., and flooded by the R. Mekong (q.v.). The chief products are rice, maize, vegetables, and indigo. The inhab. are composed of Malays, Vietnamese, Cambodians, Chinese, and Chams. The cap. tn, C., stands at the head of a canal which forms a connection with the riv. and the port of Ha-tien.

Chaulieu, or **Chaulieuc**, **Guillaume Amfrye**, Abbé de (c. 1639-1720), Fr. poet and wit, b. Fontenay, Normandy, styled the 'Anacreon of the Temple,' the coterie of which the grand prior Vendôme was the head. He received the abbey of Aumate and other livings from his patron Louis Joseph, Duc de Vendôme. He and his friend, the Marquis de la Fare (1644-1712), were the most prominent Fr. poets at the beginning of the 18th cent., and their works were ed. together in 1714 and twice later in the same cent. Both derive, on the one hand, from the artificial school of Voiture (1593-1648), and, on the other,

from the Bacchic sect of St Amand. C.'s compositions were generally lyrical quatrains of the kind ridiculed by Molière, yet some are not without merit, as *La Solitude de Fontenay*, *La Goutte*, and the *Ode sur l'Inconstance*.

Chaulmoogra, E. Indian tree, *Gynocardia odorata*, of the family Flacourtiaceae. Its fruit yields a light brown oil of soft fat, acid in taste, containing glycerides of lauric and linoleic acids, together with the active principle gynocardine. This oil is used in the treatment of leprosy.

Chaumette, Pierre Gaspard (1763-94), Fr. revolutionary, b. Noyers. He became a medical student in Paris, and a leading orator at the club of the Cordeliers. Later, while expressing extreme revolutionary views, he worked hard to improve the social conditions of the poor of Paris. His anarchism made him hated by Robespierre, who eventually had him guillotined.

Chaumont (-en-Bassigny), Fr. tn, cap. of the dept of Haute-Marne, situated on a height at the confluence of, and between, the Marne and the Suize. Here, in Mar. 1814, Great Britain, Austria, Russia, and Prussia bound themselves by treaty against Napoleon; this partnership became the Holy Alliance (q.v.). Gloves, paper, cutlery, and leather goods are manuf. Bouchardon was b. at C. Pop. 16,900.

Chaumont-sur-Loire, Fr. vil. in the dept of Loir-et-Cher, 12 m. SW. of Blois (q.v.), on the Loire. Its fine, towered château (begun in 1465 by Peter of Amboise) was once the property of Catherine de' Medici, who forced Diane de Poitiers (qq.v.) to accept it in exchange for Chenonceaux (q.v.). The château now belongs to the State. Pop. 800.

Chauncey, Isaac (1772-1840), Amer. naval commander, b. Black Rock, Connecticut; entered the U.S. Navy as a lieutenant in 1799. Served with distinction against the Barbary pirates in Tripoli, and on the lakes during the war of 1812. Taking the command at Sackett's Harbour in 1812, C., then a commodore, increased the strength of Amer. ships from a single vessel (the brig *Oneida*) to 20 ships. Later, when Sir James Yeo was sent out from England, he lost 2 of his schooners in a skirmish with the Eng. commander, but Yeo's resources proving inadequate, C. compelled him to give up the blockade of Sackett's Harbour. Was president of the Board of Naval Commissioners from 1832 till his death.

Chauney, Charles (1592-1672), nonconformist divine, b. Herts; became Gk prof. at Cambridge, and later vicar of Ware, Herts. His religious convictions brought him into difficulties, and in 1638 he emigrated to Massachusetts. He preached for 12 years at Scituate, and in 1654 became president of Harvard College.

Chauny, Fr. tn in the dept of Aisne, on the Oise and the St-Quentin canal. There was much fighting here during the Hundred Years War (q.v.). C. was destroyed in the First World War, rebuilt, and again

damaged in 1940. Chemicals, sugar, metal and leather goods, and glass are manuf. Pop. 9200.

Chausey, group of small is. belonging to France, in the Eng. Channel, nearly opposite the port of Granville (cf. CHANNEL ISLANDS). The largest is about 10 m. long by 4 m. wide. Granite is quarried in large quantities during the summer months.

Caussée, Pierre Claude Nivelée de la, see LA CHAUSSÉE.

Chausson, Ernest (1855-99), Fr. composer, b. Paris, where he attended the Conservatoire for less than a year in 1880 and then became a pupil of Franck until 1883. He was greatly influenced by his master. Of independent means, he never held a professional post and was too aloof and diffident to make a success in his lifetime. He d. from a bicycle accident. His works include 3 operas, of which only *Le Roi Arthus* was produced, in 1903; incidental and church music; choral works; a symphony, and the symphonic poem *Viviane*, a *Poème* for violin and orchestra; chamber and piano music, and 32 songs which are the largest section of his small output.

Chautauque, beautiful lake of glacial origin in the co. of C., New York, U.S.A. It is 1300 ft above sea level. Its length is 18 m., while the greatest breadth is 3 m. It lies 8 m. away from Lake Erie, and 700 ft above it. On its shores stands the C. Institution, an adult school, founded by John H. Vincent and Lewis Miller in 1874 for instruction in literature, art, and science. The C. Assembly grounds, lying to the N. of the lake, cover about 165 ac., and contain about 500 cottages, a hall with seating accommodation for 5000 persons, a fine hotel, and a museum.

Chauvinism, term used for unreasonable and exaggerated patriotism and pride in one's own country, with a corresponding contempt towards other nations. It is the Fr. equivalent of the Eng. 'jingoism.' Nicolas Chauvin was a veteran of the *Grande Armée* noted for his devotion to the Emperor, and his name became a synonym for the blind worship given by Frenchmen to Napoleon. Chauvin has been represented on the stage as a patriotic character by many writers, e.g. in T. and H. Cogniard's *La Cocarde tricolore*, 1831.

Chaux-de-Fonds, La, industrial tn in the canton of Neuchâtel, Switzerland (3250 ft). It is the chief centre of the watchmaking industry, and has a school for the engraving and enamelling of watch-cases. Pop. (1955) 36,700.

Chavanne, Joseph (1846-1902), Austrian traveller and geographer, b. Graz. From 1867 to 1869 he travelled in N. America, Central America, Morocco, and the Sahara; and from 1884 to 1885 he explored the Congo.

Chavannes, Pierre Cécile Puvis de, see PUVIS.

Chavasse, Francis James (1846-1928), bishop, son of Thomas C. of Sutton Coldfield. He became vicar of St. Peter-le-Bailey, Oxford, 1878; succeeded Dr Ryle as Bishop of Liverpool, 1900. The

building of Liverpool Cathedral owed much to his energy and zeal.

Chaves, tn of Portugal, in Vila Real dist., on the Tâmega, 35 m. NNE. of Vila Real (q.v.). It has a Romanesque church and an anct castle of the dukes of Bragança. There are silk and linen industries, and thermal springs. Pop. 9000.

Chazelles, Jean Mathieu de (1657-1710), Fr. mathematician, b. Lyons, who assisted Cassini in measuring the meridian, and in 1685 was appointed hydrographical prof. at Marseilles. Later he went to Egypt and measured the Pyramids, discovering that the 4 sides of the pyramid of Cheops answer to the cardinal points of the compass.

Chazelles-sur-Lyon, Fr. tn in the dept of Loire, 23 m. from Lyon. It manufs. felt hats and silk. Pop. 6100.

Chazy, name given by Amer. geologists to the limestone found at C., New York, and elsewhere in N. America.

Cheadle, mrkt tn in Staffs, England, 13 m. NE. of Stafford. There are important collieries in the neighbourhood; also manufs. of brass, copper, and tin. The silk mills and tape factory form other considerable industries. The Rom. Catholic church of St Giles was designed by Pugin, and erected in 1864. Pop. 6000.

Cheape, Sir John (1792-1875), general, who in 1849 did admirable service in the battle of Gujarat under Lord Gough. It was owing to his efforts that Pegu and Tenasserim were added to the E. India Co.'s possessions in 1850.

Cheapside, street in the city of London, between St Paul's and Poultry. The name derives from O.E. *ceap* ('barter'), and in anct times it was Cheap or West-cheap, the latter in distinction to East-cheap. The form C. was in use early in the 15th cent. and possibly earlier. It became the chief market-place in the city, and its former extent was considerably greater than now. Various streets off C. attest their functions in the old market: Milk Street (where Sir Thomas More was b.), Bread Street, Wood Street, etc., and it was a centre of goldsmiths and silversmiths. Until modern times C. witnessed more pomp and pageantry than any other street in London, and it was also a place of penance and punishment. In the Middle Ages royal tournaments were held in the open ground on the N. side, the king and nobility watching from a balcony on Bow Church (q.v.). An Eleanor Cross stood at the junction with Wood Street until its destruction by Parliament in 1643. Between Friday Street and Bread Street stood the famous Mermaid Tavern (q.v.). C. suffered severely from bombing in the Second World War, when Mercers' and Saddlers' Halls were destroyed. Poultry, the eastward extension of C., was formerly that part of the Cheap where poultry was sold, and was noted before the Great Fire for numerous inns. See Kenneth Rogers, *Old Cheapside and Poultry*, 1931.

Cheating, see FRAUD.

Cheb (Ger. *Eger*), Czechoslovak tn in the region of Karlovy Vary (q.v.), on the

Ohre (q.v.) near the Ger. border. It was once an important border fortress, and was taken by the Swedes in 1631 and 1647, and by the French in 1742. Wallenstein (q.v.) was murdered here in 1634. Before the Second World War, C. was the centre of the Sudeten Ger. movement (see SUDETENLAND) and was in Ger. hands, 1938-45. There is a 13th-cent. church, an auct keep, and many other old buildings. The tn is a railway centre and has a textile industry. Pop. (1939) 32,000; (1947) 14,600.

Chebishev, Pafnutiy Lvovich (1821-94), Russian mathematician, b. Borovsk, educ. at Moscow Univ. He was a member of the Royal Society of London. He wrote treatises on the theories of prime numbers, probabilities, and integrals; on quadratic forms, gearings, etc. He came near to devising a straight-line motion, but this was finally devised by one of his pupils. Pub. *Traité de la théorie des nombres*.

Cheboksary, see CHEBOKSARY.

Cheboksary, tn on the Volga, 85 m. W. of Kazan', cap. and cultural centre of the Chuvash (q.v.) Autonomous Rep. It has been known since 1371. It has textile and timber industries, and a hydro-electric power station (800,000 kw.) is projected. Pop. (1956) 63,000 (1926 9000), mainly Russian.

Cheboygan, city, cap. of C. co., Michigan, U.S.A., on S. Channel of Straits of Mackinac in agric. and resort area with limestone quarrying and fisheries. Pop. 5700. Not to be confused with Sheboygan, Wisconsin.

Chechen-Ingush Autonomous Republic, administrative div. in N. Caucasus (Russia), re-estab. in 1957, with Groznyy as cap. (For a description of the area see GROZNYI.) The area was included in the Mt Peoples' Autonomous Rep. (q.v.); Chechen Autonomous Oblast was singled out in 1922, Ingush Autonomous Oblast in 1924, and they were combined in 1934 into C.-I. Autonomous Oblast, transformed into an autonomous rep. in 1936. The native pop. was deported in 1943 for alleged collaboration with the Germans, and the rep. abolished and dismembered in 1944, the major part forming the core of the Groznyy Oblast and smaller parts being annexed to Georgia, N. Ossetia, and Daghestan.

Checcuy, Checqui, or Chesky, heraldic term describing a shield patterned with small squares of alternate tinctures.

Ceddar, vil. in Somerset, England, 22 m. SW. of Bristol. Famed for the large stalactite caves which form a source of great attraction for summer visitors. The remains that have been found in these caves prove the existence of Rom. settlements at C. The beautiful rocky way which leads from the Mendip Hills down into the vil. is known as the C. Gorge. The noted C. cheese is made here and in the surrounding dist. Pop. 3500.

Cheddite, generic name of various blasting (q.v.) explosives consisting essentially of a chlorate incorporated with a nitro-compound dissolved in castor oil, which acts as a phlegmatizer. The salt

generally employed is potassium chlorate. See EXPLOSIVES.

Chedorlaomer (Kudur-Lagamar, servant of Lagamar), king of Elam, chief of 4 kings who fought a victorious campaign against 5 rebel Canaanite princes (Genesis xiv). Lot was taken by the kings, but rescued by Abraham. Lagamar was an Elamite god.

Cheduba, or Man-aung, is. in the Bay of Bengal, 10 m. from Arakan. The soil is fertile, the chief crops being rice and tobacco, also cotton, indigo, and the sugar cane.

Cheera, see CHIRA.

Cheering, or American College Yells. There is little analogous in Eng. univs. and schools, in Brit. C. or in the Fr. *vival*, or in any other known conventional C. or form of acclamation, to the Amer. college 'yells.' The yell in univs. both in the U.S.A. and in Canada is a cry consisting of certain sounds or words agreed or fixed on to be used by the students as distinctive of the particular college or institution to which they happen to belong. The Amer. college yell is rhythmical; though C. conducted rhythmically is familiar enough in England and elsewhere, it is generally no more than a preconceived rhythm with nothing of the habit or usage so characteristic of the student of W. nations. In all probability the college yell has evolved itself out of the primitive war-cry like the *houzè* or *vital* of France, and this origin indeed is certain in the case of the yell adopted by the 'All-Blacks' or team of rugby footballers that first visited England in 1907 from New Zealand. The yell of this team was admittedly a kind of war-cry adapted from some customary cry of the Maoris. The oldest cheers are those of the New England colleges, Yale and Harvard, in which the basic element *rah* is really nothing more than an abbreviation of the Eng. *hurrah*. The original yells of these 2 leading univs. are identical in form, being simply the cry 'rah' shouted in unison 9 times with the name of the univ. at the end of the repetition; but the yell of Yale is uttered more quickly than that of Harvard. Most institutions have a number of different yells and variants of the original yell, Yale itself favouring a cheer which runs thus:

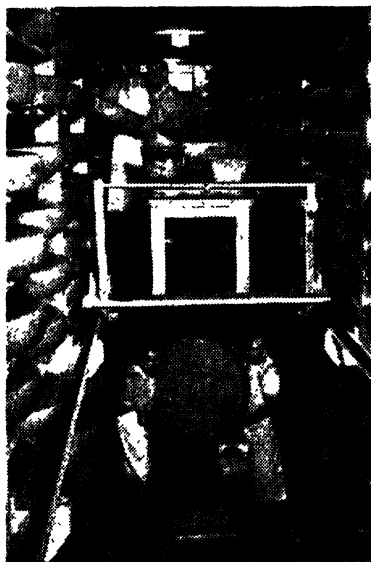
'Brokekekex, ko-ax, ko-ax
Brekekekex, ko-ax, ko-ax
O-op, O-op, parabalou
Yale, Yale, Yale.
Rah, rah, rah, rah, rah, rah,
rah, rah,
Yale! Yale! Yale!'

The yell of Princeton Univ. runs:

'H'ray, h'ray, h'ray, tiger
Siss, boom, ah; Princeton!'

and this college also expands this into a triple cheer on occasion. The U.S. Naval Academy adopts a yell or cheer which is aptly enough an imitation of a nautical steam siren. The Amherst cheer is very similar to the original yells of Yale and Harvard, while the Toronto Univ. students repeat or spell the word

'varsity' sev. times and end with the stereotyped 'rah, rah, rah.' There are also, besides these individualised cheers, yells or cheers common to all Amer. colleges and generally made use of in acclaiming some successful athlete or popular prof. For the most part the college yell is used at athletic contests. In most of the large colleges there are sev. carefully chosen leaders, who stand in front and call for the different songs and yells, directing and synchronising with their arms and bodies in a manner more elaborate than that of an orchestra conductor.



Swiss National Tourist Office

CHEESE BEING SALTED AND STORED

Cheese (Lat. *caseus*), preparation of milk, produced by separating the proteinous or nitrogenous substance known as casein or curd from the whey. The fatty matter in milk forms an important constituent of C., and often there is present in C. a greater percentage of fat or butter than of casein. Therefore the finest C.s are made from the richest milk, and the various kinds of C. on the market are as much due to the different qualities of milk in various dists. as to the different processes of making. C. was known in very early times; frequent references to it occur in Gk and Rom. authors, and the methods used in C.-making are described by Columella. The casein in milk is separated by acids in the case of sour milk, or by rennet prepared from the stomach of sucking calves.

Fresh milk is warmed to a temp. of about 80°-85° F., when the rennet is added in a liquid form, which causes the milk to ferment. The curd thus produced is cut across into sev. pieces. The mass is stirred for a few minutes, and then heated up to 90°-100° F. The object of the operator is to bring about the proper consistency of curd, without losing any of the fat of the butter in the whey. The whey is finally drawn off, and the curd left to settle until it becomes a firm solid. The fermenting action of the rennet continues during the period of ripening the curd. The curd is tested from time to time with a hot iron. If the development of acidity has been allowed to go too far, the curd becomes brittle and cracks easily. When the hot-iron test shows fine long flakes the curd is cut up into slabs and passed through a small grinder. Salt is now added to the substance to prevent any further development of acidity, and the substance is wrapped in cloths, and left to mellow in a cool room or cellar. The hard C.s, made in the U.K. and in America, improve in quality by keeping. They are generally left for sev. months to ripen, and when finished are fairly hard in substance. Continental C.s, on the other hand, are soft, and most of them require to be eaten when quite fresh. The chief hard C.s are Cheddar, Stilton, Eng. Cheshire, Gloucester, Wilt's, Gorgonzola, and Gruyère. The best-known soft C.s are Brie, Neuchâtel, Camembert, and Limburg, and Philadelphia cream. C. is a very nutritious food. Well cured C.s contain 30-40 per cent of moisture, 30-37 per cent of fat, 20-26 per cent of protein, and 3-7 per cent of sugar and ash. The amount of salt (being an added constituent) is variable. See E. R. Ling, *A Text Book of Dairy Chemistry*, 1930; A. L. Simon, *A Catechism concerning Cheeses*, 1936; J. Squire (ed.), *Cheddar Gorge: a Book of English Cheese*, 1937; L. C. van Slyke and W. V. Price, *Cheese*, 1938.

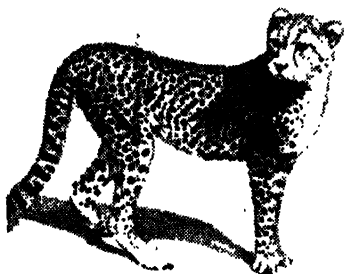
Cheese-hopper, or **Cheese-skipper**, is the larva of a small dipterous insect, *Piophilidae casei*, of the family Sepsidae.

Cheese-mite, or *Tyroglyphus siro*, is an arachnid related to many other mites which are either parasitic or live on organic matter such as carrion and plants.

Cheese-rennet, or *Galium verum*, species of Rubiaceae allied to the cleavers (q.v.), and obtains its popular name from having been formerly employed to curdle milk. See also BEE-STRAW.

Cheetah, **Cheeta**, **Chita**, and **Hunting Leopard** are all names of *Acinonyx jubatus*, which with the various species of *Felis*, e.g. lion, tiger, and leopard, constitute the family Felidae in the group Aeluroidea, or cat-like carnivores. It differs from other members of the family chiefly in having longer limbs with non-retractile, blunt claws, and the upper carnassial tooth has no inner tubercle. With such claws it is more adapted to obtaining its prey in chase, like the dog, rather than by cat-like stealth, and it is readily domesticated, again like the dog; when tamed it will purr

like a huge cat. It is distributed over the whole of Africa, W. Asia, and India, and in S. India it is largely used in hunting. At full speed it may attain a speed of from 60 to 70 m.p.h. and is probably the swiftest of all mammals.



CHEETAH

Chefoo, or **Yental**, port in the prov. of Shantung, China, with a Chinese pop. of 132,000. C. is noted for its large fruit-growing industry. Silk thread and twist are largely made and exported to France and America. A railway was built in 1955 to link with Tsingtao on the S. side of the Shantung Peninsula. C. is a beautiful seaside city, and is much frequented by invalids as a health resort in summer. The port was of considerable importance during the Russo-Jap. war.

Cheilanthes, genus of Polypodiaceae, contains about 130 species of small but beautiful ferns. The fronds are often curved and bear small hairs. *C. pteridoides* will grow in Britain under sheltered conditions.

Cheiranthus, genus of Cruciferae of 10 species of biennial or perennial herbs, natives of temperate regions. *C. cheiri*, Wallflower (q.v.), and *C. × allionii*, Siberian Wallflower, are grown in gardens.

Cheiromaney, see PALMISTRY.

Cheiroptera, see BAT.

Cheirostemon Platanoides, Hand-tree or Hand Plant, is the single species of its genus, family Sterculiaceae. It inhabits Mexico and is a lofty evergreen tree with the habit of a plane and a trunk the thickness of a man's body; at the head are dense branches, brownish at the tip from the short, fawn-coloured hairs that beset them. The leaves are heart-shaped, and the bright red flowers bear stamens arranged in the form of a hand. The tree has been an object of curiosity and veneration from time immemorial.

Cheka (Russian abbreviation for **Extraordinary Commission**), name of the Soviet political police, 1917-22. The local, territorial, and 'functional' (in the transport system and the armed forces) C.s were

directed by the 'All-Russian Extraordinary Commission for fighting counter-revolution and sabotage' headed by Dzerzhinskiy. The C. carried out the policy of Red Terror which was considered necessary by the Bolshevik leadership for the survival of the regime. It exercised press censorship, set up internal security troops, and a system of concentration camps, and carried out arrests and executions of arbitrarily selected individuals or groups (including shooting of hostages). In 1922 the C. was renamed G.P.U. (q.v.). The word *chekist* is still used to refer to members of the Soviet security organs. See E. J. Scott, 'The Cheka,' in *St Antony's Papers*, No. 1, Soviet Affairs, 1956.

Cheke, Sir John (1514-57), classical scholar, b. Cambridge, where he was educ. at St John's College. Elected fellow in 1529. On account of his great abilities he gained an exhibition from the king, and in 1540 was made prof. of Greek at the univ. He numbered amongst his pupils at St John's Roger Ascham, who always spoke of him in high terms of praise, both for his learning and character. He introduced a new pronunciation of Greek, which at first raised much opposition at the univ.; but C. finally prevailed, and the system was used in England until quite recent years. He was apostrophised by Milton in his 'Tetrachordon' sonnet. In 1544 he was made tutor to young Prince Edward. In later years he was banished from England on account of his religious opinions. He remained abroad from 1554 to 1556; then, whilst travelling one day from Brussels to Antwerp, he was arrested by order of Philip of Spain and sent to the Tower of London. Here he publicly renounced the tenets of Protestantism and submitted to the Church of Rome into which he had been baptised.

Chekhov, Anton Pavlovich (1860-1904), Russian author. His grandfather was a serf, his father a prov. grocer. By taking tutoring posts and writing for humorous periodicals he managed to pay his way through univ. and qualify as a doctor. He practised for a short period but then decided to devote himself entirely to literature, though his medical training was of considerable value in his writing. In 1890-1 he travelled to the penal colony of Sakhalin Is., which he described on his return with great frankness and insight. From his youth he suffered from tuberculosis, finally dying of it. C. wrote many short stories, sev. long stories (*The Step*, *A Dreary Story*, *Ward No. 6*, *Peasants*, etc.), and curtain-raisers, and the plays *Ivanov*, 1887, *The Seagull*, 1896, *Uncle Vanya*, 1897, *The Three Sisters*, 1901, and *The Cherry Orchard*, 1903. He became famous during the nineties; the Moscow Arts Theatre grew up on his plays, and in 1900 he was elected to the Academy of Sciences, resigning 2 years later in protest against the Tsar's refusal to allow the Academy to elect Gorkiy. He was friendly with both Tolstoy and Gorkiy, being to some extent influenced by the one and influencing the other. C.'s writing

reflected the social life in Russia of the 1880's and 1890's, but through non-descript Russian prov. families he attempted to portray universal aspirations and emotions, giving an original interpretation of human behaviour. He initiated a 'Chekhovian trend' in the Russian literature of the 1900's, and from the 1920's his influence spread to W. Europe and America: Katherine Mansfield, Virginia Woolf, Elizabeth Bowen, and Ernest Hemingway, among others, were clearly indebted to him. See life by D. Magarshack, 1952; studies by W. A. Gerhardl, 1947, W. H. Bruford, 1948, R. Hingley, 1950; bibliography by A. Heifetz. *Chekhov in English*, 1949.

Chekiang, coastal prov. of China. The Hsienhsia and T'ient'ai ranges run through the centre of the prov. from SW. to NE., and divide it into a N. portion, the greater part of which is drained by the Chientang R., and a S. portion, which is chiefly occupied by the Tangchi basin. The hilly portion of the prov. provides large supplies of tea, and in the plains a great quantity of silk is produced. Minerals are poor—a little coal and iron and occasionally some copper are found—but other products such as cotton, rice, ground-nuts, wheat, indigo, and beans may be had in abundance. The R. Hsingan in the W., a trib. of the C., has enormous hydro-electricity potentiality and an underwater power station supplies electricity to the big cities in the Yangtse Delta, including Shanghai and Nanking. The prin. cities are Hangchow, Wushing, Kashing, Ningpo, Shaoshing, and Wenchow. Area 39,020 sq. m.; pop. 22,865,747.

Chelan, Lake, in Okanogan co., Washington, U.S.A. It is c. 50 m. long, and from 1 to nearly 1½ m. wide. All round are rock walls 1000–5000 ft. high, and the greatest depth is about 14,000 ft. It drains into the Columbia R. through the C. It. (½ m. long; source of hydro-electric power).

Chelate Compounds, compounds in which a ring occurs, some part of the ring being formed by a linkage which is partly electrovalent and partly covalent, thereby differing from the ordinary type of ring, in which all the valencies in the ring are covalencies.

Chelický, Petr (c. 1390–1460), Czech writer. He has been called the Tolstoy of the 15th cent., for his horror of bloodshed and determination to accept unresistingly even the tyrannical rule of worldly authorities. Born at Chelčice, near Vodňany, the son of a small landowner, he studied for some years at Prague. During the Hussite wars he took no part, although opposed to the Church of Rome. His prin. work is *Sit'vity* (The Net of Faith).

Chelidonium Majus, see CELANDINE.

Chelifer, genus of arachnid in the order Chernetidea, and typical of the family Cheliferidae, the only one of the order. *Ch. cancrroides*, the book-scorpion, is sometimes found in houses among old papers and furniture; it occurs in Britain with 4 other species.

Chelm (Russian Kholm), tn of Poland, in Lublin prov., 40 m. ESE. of Lublin (q.v.). It was made an Orthodox bishopric in the 13th cent. During the First World War there was much fighting in its neighbourhood, and in the Second World War it was the first Polish city taken in the Russian advance (1944). C. is an important railway junction, and has metal, brick, and foodstuff manufs. Pop. 25,000.

Chelmno (Ger. Kulm), tn of Poland, in Bydgoszcz prov., on the Vistula, 24 m. NE. of Bydgoszcz (q.v.). In 1231 it came into the hands of the Teutonic Knights (q.v.), in the 15th cent. it went to Poland, and in 1772 it went to Prussia. It was once a member of the Hanseatic League (q.v.). Machinery, foodstuffs, ironware, and furniture are manuf. Pop. 12,000.

Chelmsford, Frederic Augustus Thesiger, 2nd Baron (1827–1905), eldest son of the 1st Baron C. He was educ. at Eton, and in 1844 entered the Rifle Brigade. From an ensign in 1854 C. became a general in 1888. After serving in the Indian Mutiny, and taking part in the capture of Magdala, C. was made C.B. and aide-de-camp to Queen Victoria. He routed the Zulus under Cellinaga at Ulundi in the war of 1879, and in 1884 was appointed lieutenant of the Tower of London, which post he held until 1889. See Maj. G. French, *Lord Chelmsford and the Zulu War*, 1939.

Chelmsford, Frederic John Napier Thesiger, 1st Viscount and 3rd Baron (1868–1933), administrator, eldest son of Frederic Augustus, 2nd Baron. He was educ. at Winchester and at Magdalen College, Oxford. He succeeded to the barony in 1905, and was Governor of Queensland 1905–9. In Aug. 1909 he was transferred to New S. Wales, where he governed till 1913. In 1916 he was appointed Viceroy of India, and in the following year he produced jointly with E. S. Montagu, the secretary of state, a report on constitutional progress, recommending a limited application of representative gov., which, introduced in 1919, created what was called dyarchy. On 13 April 1919, occurred the famous Amritsar riot (q.v.). In April 1921 Lord C. was replaced by Lord Reading. In 1924 he was First Lord of the Admiralty in the Labour Gov.

Chelmsford, Frederic Thesiger, 1st Baron (1794–1878), lord chancellor of England. He entered Gray's Inn in 1812, and became a member of Parliament for Woodstock in 1840. In 1844 he became solicitor-general, and in 1845 attorney-general. He was appointed lord chancellor in 1858 by Lord Derby.

Chelmsford, co. and mkt tn in Essex, England, 29½ m. NE. of London; situated between London and Colchester. The prin. industries are the manuf. of agric. implements, electrical and engineering works, iron foundries, malt works, and corn mills. The corn and cattle markets are among some of the most important in the co. The tn possesses a grammar school founded by Edward VI. Pop. 37,888.

Chelonia (Gk *chelōnē*, tortoise), name of a sub-class of reptiles which comprises such well-known animals as the tortoises, turtles, terrapins, and loggerheads, and of which many fossil species have been found. There are about 300 living species, dwelling chiefly in warmer climates, some as terrestrial animals, while others are aquatic, and may inhabit either fresh or salt water.

Chelsea, parl. and metropolitan bor. of W. London, on the N. bank of the Thames. The name means 'landing place for chalk or limestone.' Until the 18th cent. C. remained a riverside vil., although Charles II had founded (1682) the Royal Hospital for old and disabled soldiers, designed by Wren and completed under William III in 1694. Henry VIII had a manor house here which was demolished c. 1760. C. Old Church, a medieval structure of various dates, was, except for the SE. or More Chapel, mostly destroyed by bombing in 1941, but is being rebuilt. Some of the monuments survived, including that of Sir Thomas More. Crosby Hall, set within the hostel building of the Brit. Federation of Univ. Women, is a 15th-cent. structure (with a magnificent timber roof) transferred here from Bishopgate in the City of London in 1910. More lived in it for a short time; he spent the last years of his life in C. The C. Physic Garden, for botanical research, was founded c. 1673 by the Society of Apothecaries. Owing to its riverside and architectural charm and air of quiet seclusion many artists and men of letters have lived in C. since the early 19th cent., including Turner, Rossetti, Oscar Wilde, Whistler, and Carlyle, and the home of the last is now a public museum. C. was formerly famous for its buns and its porcelain. It returns 1 member to Parliament. Area 660 ac.; pop. 52,000. See *Win Gaunt, Chelsea*, 1954.

Chelsea, city in the co. of Suffolk, Massachusetts, U.S.A., situated on the estuary of the Mystic R. It manufs. elastic goods, shoes, rubber goods, chemicals, paints, and wood products, and has a printing industry. Pop. 38,910.

Chelsea (London) (c. 1745-84), factory producing the finest soft-paste porcelain (q.v.) in England. See *W. King, Chelsea Porcelain*, 1922.

Chelsea Hospital, see **ROYAL HOSPITAL**.

Chelsham, tn and par. of Surrey, England, in Godstone (q.v.) rural dist., with a 14th-cent. church. Pop. 1643.

Cheltenham, municipal and parl. bor. and spa of Glos., England, 8 m. ENE. of Gloucester, and lying on a gentle slope at the foot of the Cotswolds. To the S. and W. is an open plain with the R. Severn (6 m.) and the source of the Thames (4 m.). St Mary's church, now modernised, was built between the Norman period and the 14th cent. In 1716 mineral springs were discovered, and after a pump-room had been built in 1738 C. soon became an important and fashionable health resort, particularly after George III came to take the waters in 1788. The tn has some excellent examples of Regency archi-

tecture and ironwork. C. is also an educational centre: the C. Ladies' College (q.v.) is one of the most celebrated girls' schools in England, and C. College (q.v.) is a well-known public school for boys. The composer Gustav Holst (1874-1934) was b. here; an annual Festival of Contemporary Music is held during July (the second and third weeks), and of Contemporary Literature during October (first week). Pop. 62,823.

Cheltenham College, public school for boys, founded in 1841, incorporated in 1894. There are 450 boys in 6 boarding houses and a day boy house. The College is famous for its old Army connections and for the beauty of its buildings.

Cheltenham Ladies' College, public school for girls, founded in 1853 by the Rev. W. Dobson, principal of Cheltenham College, and the Rev. H. Walford Bellairs. Incorporated in 1880, it is now one of the most important English girls' schools, and was one of the first in England to provide a sound education on the public school boarding system for girls. Miss Dorothea Beale (q.v.) was the principal from 1858 until her death in 1906.

Chelyabinsk: 1. Oblast in Russia, on the E. slopes of the S. Urals, steppe in the S. and partly covered with mixed forests in the N. There are large deposits of high-grade iron ore, ferro-alloy, copper-pine and aluminium ores, gold, and lignite. Area 33,900 sq. m.; pop. (without C. city, 1956) 2,155,000, Russian (since the 18th cent.) and Bashkir. It has the biggest iron and steel industry in the Urals, and highly developed engineering, non-ferrous metallurgy, and chemical industries. Wheat-growing and cattle-raising for meat and milk are other activities. The prin. tns are C., Magnitogorsk, Kopeysk, Zlatoust, and Miass. It is the area of the most rapid industrial development in the Urals during the Soviet period.

2. Cap., economic and cultural centre of the above, directly subordinated to the gov. of the Russian Federal Rep.; it is the second largest industrial centre of the Urals (q.v.) and an important transportation centre (5 railway lines). The leading branches of industry are engineering (tractors, aircraft, machine tools) and metallurgy (steel, ferro-alloys, zinc). There is a large lignite-fed power-station. Formerly a Tatar vil., became a Cossack fortress in 1746, and until 1890 was an important trading point between Siberia, with its agriculture, and the mining centres of the Urals. The construction of the Trans-Siberian Railway (q.v.), which started at C., further increased its commercial importance, the first industries also appearing at that time (flour mills, railway workshops); C. replaced Tyumen' as the 'gateway to Siberia' for goods and settlers. The pre-war Five-Year Plans and the Second World War raised the city to its present industrial significance. Pop. (1956) 612,000 (thirteenth in the U.S.S.R. and second in the Urals; 1897, 20,000; 1917, 47,000; 1926, 59,000; 1931, 117,000; 1939, 273,000; 1945, 400,000).

Chelyuskin, Cape, of the Taymyr peninsula in N. Siberia, is the northernmost point of the Asian continent (lat. 78° N.).

Chemical Action, see CHEMISTRY.

Chemical Affinity, see AFFINITY (*Chemical Affinity*) and CHEMISTRY.

Chemical Analysis, see ANALYSIS, CHEMICAL.

Chemical Energy. Since molecules and atoms are conceived of as being in a state of motion, it is evident that by virtue of this motion they must contain energy (q.v.). In most chemical reactions heat is evolved, and they are said to be exothermic. On the other hand, heat may be absorbed, in which case the reaction is endothermic. This contained energy cannot be measured directly, but the energy set free during chemical reaction can, and this is termed chemical energy. It can even then only be measured by converting it into heat or electric energy. It might here be noted, perhaps, that the amount of energy measured only represents the difference between the contained energy in the resultant compound and that contained in the substances which took part in the reaction. See THERMO-CHEMISTRY.

Chemical Engineering, technology or applied science comprising the design, construction, and operation of plants for the chemical and process industries, and the scientific study of their operation. Although the chemical and process industries are diverse they are related by the fact that in them materials are changed in composition or physical state; a number of the more important ones are described below. In each, the initial factors to be considered in the design of a plant will probably be chemical—the chemical properties of materials being processed, the nature, rates, and equilibria of reactions recurring between them, and the corrosiveness of reactants and products. Knowledge of mathematics, physics, and physical chem. will be needed to work out how the necessary heat can be supplied or removed from the reactor and how to separate and isolate products, and detailed mechanical engineering knowledge to work out the wall thicknesses of vessels and to design the plant items for convenience and simplicity in fabrication, operation, and maintenance.

Although the chemical and process industries are so diverse in their products, many of the individual steps in their different manufacturing processes are very similar, and we find, for example, that methods originally developed by sugar refiners for concentrating their syrups have since been adopted by sulphuric acid manufacturers. Thus the chemical engineer has evolved as a specialist in these 'unit operations' of common interest. The chemical engineer is not a chemist who has picked up a good deal of engineering, or the reverse, but a man whose training in the principles of the common 'unit operations' and 'rate processes' of the chemical and process industries is based on a carefully

dovetailed and interrelated knowledge of chem. engineering, mathematics, and physics.

Foremost amongst the industries in which the chemical engineer is employed is the chemical industry in which plants range from those making fertilisers and heavy chemicals in hundreds or thousands of tons per week, through those making dyestuffs, solvents, detergents, or plastics, to elaborately engineered plants making only a few pounds per week of a pharmaceutical chemical. Next in number of chemical engineers employed is the chemical plant manufacturing industry. This comprises the growing class of specialist contractors with large-scale research laboratories, fabricating and assembly shops, who can design, engineer, and erect complete plants for the production of particular chemicals, and contractors who concentrate on plant of particular types or made of special materials. The petroleum industry, with its post-war policy of refining in this country, had already in 1954 become the third largest employer of chemical engineers, and the number employed is increasing rapidly. Once a matter mainly of distillation, oil refining to-day involves many chemical conversions quite apart from the production of organic chemicals from refinery by-products or specially cracked oil, and necessitates the application of C. E. principles on the largest possible scale. Of the remaining industries, 3, namely food, fermentation, and metal extraction, merit special mention for their economic importance and technical interest.

In no field are the contributions of the chemical engineer more conspicuous than in that of food production. Through the chemical industry's manuf. of fertilisers and weed and pest control agents he greatly assists its production. But his contribution is not less great in assisting its long-distance transport and storage, and its processing and preservation. Sugar refining, margarine and baker's yeast manuf., canning and deep freezing of fruit and vegetables are obvious large-scale examples. On the small scale the extraction of vitamins may be cited.

After agriculture, fermentation is probably our oldest industry and to-day it is being increasingly extended from the production of food and drink to the production of drugs and vitamins. In contrast to many of the older fermentations, maintenance of high yields in antibiotic and vitamin fermentations usually requires aseptic conditions, as well as the accurate control of the many process variables. The large-scale conduct of these fermentations and the extraction and concentration of the delicate exercise to the full the highest C. E. skill.

In the extraction of metals from ores C. E. is becoming increasingly important as more and more of the lower-grade ores have to be treated. An unusual example of extractive skill is the extraction of magnesium and bromine from sea water, made possible by the accurate C. E.

control of chemical conditions in vast vols. of water.

Finally, the industrial development of atomic power is demanding the services of more and more chemical engineers. From the extraction of uranium and thorium and the separation of the desired isotopes, through the construction and operation of reactors and the harnessing of the power released, to the separation of fission products and the safe disposal of radioactive wastes, the chemical engineer is involved at every stage.

Further information concerning C. E. as a career, including ways of qualifying, may be obtained on application to the Institution of Chemical Engineers, 16 Belgrave Square, London, S.W.1.

Chemical Industry, Society of, founded in 1881 and incorporated by royal charter in 1907, was estab. to 'advance applied chemistry in all its branches.' There are 16 local sections in Great Britain, and 1 each in Australia, Canada, and the U.S.A. In addition there are special subject groups for agriculture, chemical engineering, corrosion, fine chemicals, food, microbiology, oils and fats, pesticides, plastics and polymer, and road and building materials. The society publishes weekly, *Chemistry and Industry*; and monthly, *The Journal of Applied Chemistry* (with abstracts of the literature), *The Journal of the Science of Food and Agriculture* (with abstracts of the literature); also ann. reports on the progress of applied chem., and separate pubs. on special topics from time to time. The society awards a number of lectureships and gold medals; its H.Q. are at 14 Belgrave Square, London, S.W.1.

Chemical Society, formerly the C. S. of London, estab. in 1841 and incorporated by royal charter in 1848 for the advancement of chemical science by the discussion and pub. of new discoveries. Its main pubs. are the *Journal and Proceedings of the Chemical Society*, *Annual Reports on the Progress of Chemistry*, *Quarterly Reviews*, and *Current Chemical Papers*. The C. S. maintains an extensive library and makes grants to promote chemical research. Applicants for fellowship should apply to the General Secretary, the C. S., Burlington House, London, W.1.

Chemical Warfare, although now regarded as a barbarous practice, is by no means new. The ancients in Greece, cents. before the Christian era, poisoned or choked each other with sulphur fumes. It was also a practice to place dead animals in such a position that the gases emitted from the carcass during decay would drift towards the enemy and cause disease. The use of poisonous gases in the Middle Ages is also on record. With the 'humanising' of war and the recognition of laws of war, drawn up and agreed to by most civilised nations, C. W. was prohibited by a declaration of The Hague Conference in 1899. Great Britain at first withheld assent to the rule, because the conference was not unanimous, but agreed in 1907. The U.S.A. never agreed to the rule, on the ground that sufficient

information on the subject was not available on which to base a decision. During the wars of the latter half of the 19th cent.—the Crimean, Amer. Civil War, and Franco-Ger. War—suggestions for the employment of poisonous gases were not wanting, but in no case were they adopted. Poisonous gases are not mentioned specifically in the Convention of 1907, but Article 23 prohibits the signatories from employing poison or poisoned weapons. Although Germany was one of the signatories to this convention, she was the first to use poisonous gas during the First World War. On 22 April 1915, in the Ypres salient, Germany launched a gas attack from cylinders charged with a mixture of phosgene and chlorine, causing its victims either intense pain or death. It appears to have been a foregone conclusion in military circles that Germany would break the convention on this point, the belief being based on the fact that an official pub. of the Ger. Army dated 1910 advocated the fullest use of modern inventions, however dangerous. The effect of this attack was terrible, because the forces of the Entente were not prepared for the violation. As the greenish-grey cloud spread over the unprotected troops it blasted everything it touched and shrivelled up the vegetation. A cry went up at once for protective methods against gas, and a simple respirator was immediately devised and issued to the troops in the trenches. The Entente retaliated in kind, and new methods of attack with, and defence against, gas were devised. In attack the gases were either released from cylinders and carried to the enemy lines by a favourable light wind (and usually in damp weather) or were enclosed in shells fired from artillery or dropped in bombs from aircraft. The defensive measures usually consisted of some form of respirator containing a chemical which neutralised the harmful gas. The most dangerous gas was mustard gas, which burned the body, piercing clothing and equipment with ease. Gas drill became essential, and sentries were regularly posted to watch and give warning of its approach. Dug-outs were partially protected by hanging damp curtains before the doors. At the Washington Conference in 1922 the great powers agreed to prohibit the use of every kind of asphyxiating and poisonous gas in war. C. W. was not employed in the Second World War. See also CHLORINE IN WARFARE. See J. B. S. Haldane, *Callineus: a Defence of Chemical Warfare*, 1925; M. Sartori, *The War Gases*, 1939; C. Wachtel, *Chemical Warfare*, 1941.

Chemin de Fer, Baccarat, one of the 2 forms of the ant. card game of baccarat, the other being *baccarat banque*. It is almost entirely a game of chance. The object of the game of baccarat, whether C. de F. or *baccarat banque*, is to hold such cards as shall together amount to the point of 9. Every card of the value of 10, and every 10 occurring as part of a total, is disregarded, or, as it is called, is *baccarat*, i.e. zero. For C. de F. 6 packs of

cards are required. The croupier then hands an arbitrary quantity from the top of the pack to the player on his right, who for the time being is dealer or banker. The latter then places in front of him the amount he wishes to stake, and the rest, the punters, make their stakes. Any punter may, if so disposed, 'go bank,' i.e. play against the whole of the banker's stake. If the total staked does not equal the amount in the bank, other players standing round may add stakes. The banker then deals 4 cards, face downwards, the first for the player on his right, the third for the player to his left, the second and fourth to himself. The player who has the highest stake represents the other punters, but if 2 have staked equal amounts, the first in rotation has the preference. If the banker wins he takes the stakes, but if the punters win the amount of his stake is paid to each punter in rotation out of, but only to the extent of, the amount in the bank, the banker not being liable for more than his stake. If the banker wins he deals again; if not, the player next in rotation becomes banker. The game may not end, however, in the way above described. If either the banker or representative punter finds that he can score neither 9 nor 8 (the next best point) with his 2 cards, he need not turn up his cards. The punter may then draw another card on the offer of the banker. Apparently by the etiquette of the game, the punter, if his point is 0, 1, 2, 3, or 4, must accept this third card; if his point is 6 or 7 he must refuse; if 5 he has a real option. It is then the banker's turn to decide whether he himself will draw a card, and having drawn or not drawn, as he elects, to expose his cards. A tie neither wins nor loses, the stakes abiding the result of the next hand. In the variation, *baccarat banque*, the bank is put up to auction. The same rules as to offering and accepting and turning up the cards apply as in *C. de F.* As before, if the stakes exceed the amount in the bank, the banker on losing does not have to pay out beyond the amount of his own stake. The punters are paid in rotation so far as this stake extends, and those who have got nothing must wait for another successful coup. Both forms of *baccarat* are included in the games made illegal by the Eng. criminal laws against keeping common gaming-houses.

Chemin des Dames, area in France situated just N. of the R. Aisne, between Rheims and Laon, and the scene of much fighting during the First World War, in the Champagne prov. (q.v.). In their initial offensive in the autumn of 1914, the Germans swept over this area, and in the counter-attack the Entente pushed them back as far as this point, on which they rested for many months. A Fr. offensive commenced in the middle of April 1917, and after much fighting at great sacrifice the French gained a little ground in the *C. des D.* sector. Another Fr. offensive was commenced in the middle of Oct., and by the 26th so much progress had been made on the flanks of

the position that the Germans considered it wise to evacuate it. Being on the direct road to Paris from Belgium and N.E. France, *C. des D.* became the scene of much fighting when the Germans made their offensive during the spring of 1918. Here their overwhelming numbers, aided by secrecy of their intentions, easily overran the surprised Fr. garrisons and drove them across the R. Aisne. In the following July the Entente delivered its counter-offensive and drove back the Germans the way they came. This necessarily brought *C. des D.* once more to the fore as a scene of action, and much fierce fighting took place in this region. In this sector the Fr. troops were under the command of Gen. Mangin, a vigorous and able man who knew every detail of the ground over which the fighting was taking place. The Germans held this stepping-stone to Paris as long as possible, and it was not until the end of Sept. 1918 that they were eventually driven beyond this area. See also FRANCE AND FLANDERS, FIRST WORLD WAR CAMPAIGNS IN.

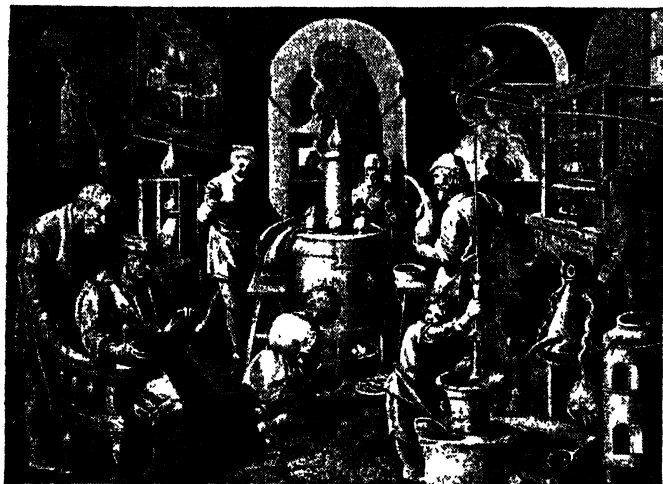
Chemist and Druggist, or Pharmacist. Under the Pharmacy Acts of 1852 and 1868, now consolidated in the Pharmacy Act, 1954, the titles pharmaceutical chemist, pharmacutist, pharmacist, chemist and druggist, druggist, or member of the Pharmaceutical Society are restricted to persons registered as a pharmaceutical chemist. In connection with the sale of goods by retail the title of chemist is similarly restricted. The Pharmaceutical Society of Great Britain (q.v.) has the statutory duty of examining students and determining the requisite educational standard for registration as a pharmacist. The Pharmaceutical Chemist Diploma awarded by the Society involves 5 years' study, 3 years as a full-time student at a recommended school. Degrees in pharmacy are awarded by the univs. of Glasgow, Leeds, London, Manchester, Nottingham, and Wales.

Chemistry, branch of that science which consists in the study of the changes which matter is capable of undergoing. These changes may be divided into physical and chemical, and although in the higher stages it is impossible to draw a definite distinction between them, *C.* and physics being converging sciences, examples can be given of both varieties of changes. For example, a steel needle rubbed on a magnet in a definite way undergoes *physical* change by means of which it acquires the power of the magnet. On the other hand, a match rubbed on a match-box undergoes a *chemical* change by means of which flame is produced. Thus it is possible to make a distinction between the sciences of *C.* and physics. A chemical change involves some alteration in the composition of the substance. The match having been ignited has undergone a permanent change, whereby it is no longer combustible. The physical change quoted above involves no alteration in the substance itself, and the acquired property is further only temporary and can be continually lost and reacquired. The difficulty occurs in this fact, however,

that every chemical change is accompanied by physical change, and the physical change may often be the only sign that chemical change has taken place. But it might be said that C. is concerned with the investigations of the changes that occur when the molecular structure of any substance is altered.

For the numerous articles in this encyclopaedia relating specifically to C., see under names of individual persons and substances. *See also* ACID; ALCOHOL; ANALYSIS; ASSAYING; ATOM; BIOCHEMISTRY; COMBUSTION; CRYSTALLOGRAPHY; ELECTROCHEMISTRY; FORMULA; GEOLOGY;

baser metals, and in their search for the philosophers' stone (*see* ALCHEMY); and in the course of their studies they discovered many potent medicines. Their writings are preserved, but the majority of them are of doubtful value from a scientific standpoint, for they are so mixed with philosophical extravagances that they are unintelligible. At the same time it must be remembered that their work was not entirely valueless, although it might possibly have been better directed—the discovery of radium and its congeners having proved the theory that the transmutation of elements is possible.



AN OLD CHEMICAL LABORATORY

METALS; MINERALOGY; MOLECULE; ORGANIC CHEMISTRY; OSMOSIS; SOLUTIONS; STEREOCHEMISTRY; SYMBOLS; THERMOCHEMISTRY.

History. The anct civilisations, Egyptians, Phoenicians, Greeks, and Romans, were familiar with sev. of the metals and the processes of extracting them from their ores, while they also knew how to make alloys, usually copper, lead, and tin. In addition to this the ancients were familiar with the manufacturing processes concerned in the making of soap, starch, glass, leather, stoneware, wine, and beer, before they were familiar with the process of distillation. Geber (Jabir ibn Hayan), an Arabian chemist of the 8th or 9th cent. AD, knew white arsenic, borax, common salt, alum, copperas (ferrous sulphate), and possibly sulphuric, nitric, and acetic acids. The apparatus used by him was similar to that used until the 18th cent. From the 8th to the 17th cent. the science of C. drifted into the hands of the alchemists. They were concerned with the production of gold from

Modern C. may be said to commence with Robert Boyle (q.v.), for he was the first to endeavour to rid C. of its alchemic tendencies. In his book the *Sceptical Chymist* (1661, 1680) he discredited the alchemic theory regarding salt, sulphur, and mercury as the elements of substances, and at the same time gave a scientific definition of an element. He it was who introduced the air-pump and the thermometer to this country, and his experiments on the physical properties of gases gave us Boyle's law (q.v.). Following him we have Becher (1635–82), and Stahl (1660–1734), who formulated the phlogiston theory of combustion (q.v., *see also* ATOM and ATOMIC THEORY). In the meanwhile Boerhaave (q.v.) pub. a system of C., and Marggraf (q.v.) studied alumina and magnesia and worked on the quantitative analysis of substances in solution. Among famous Eng. chemists of this time may be named Cavendish (q.v.), who studied hydrogen and atmospheric air, and made the important discovery of the compound nature of water

and nitric acid, and Priestley (q.v.), who discovered oxygen; and studied nitric oxide, nitrous oxide, hydrochloric acid, and ammonia gases, etc. Lavoisier (q.v.) was the first to lay down a real system of chemical nomenclature (see SYMBOLS and FORMULA). Scheele (q.v.), who lived in Sweden, discovered a large number of acids, chlorine, and oxygen. Richter (q.v.) discovered the law of reciprocal proportions, i.e. that if the weights of various elements, which combine with a given weight of another element, be compared, then they bear a simple relation to the proportions in which those elements will combine amongst themselves, e.g. chlorine and hydrogen combine with phosphorus in the proportions of weight—phosphorus : chlorine = 1 : 3.43; phosphorus : hydrogen = 1 : 0.097. Chlorine and hydrogen also combine to make hydrochloric acid, and they do so in the proportion—chlorine:hydrogen = 35.5:1; and 35.5 : 1 = 3.43 : 0.097. Berthollet (1748–1822) studied chemical affinity and applied chlorine to bleaching, and Dalton (q.v.) stated the atomic theory which placed C. on the basis of an exact science. Among the great chemists since may be mentioned Gay-Lussac, Dulong, Wollaston, and Davy (q.v.), who discovered the use of electricity for decomposing caustic soda and caustic potash with the consequent separation of the metals sodium and potassium. Berzelius (q.v.) confirmed the law of constant proportions, fixed many atomic weights, and formulated the electro-chemical theory of the constitution of salts. Those chemists mentioned above, while not regardless of organic C., devoted their attention to the study of inorganic C. In 1828 Wöhler (q.v.) discovered that urea could be made in the laboratory, and this has led to a great research into organic C., so making it a distinct and important sub-science. This work has been led by Dumas, Liebig, Laurent, Gerhardt, Wurtz, Kolbe, Frankland, Williamson (qq.v.), and others. Among general chemists of more recent times may be mentioned Faraday, Rose, Bunsen, Regnault, Mendeleev, Ostwald, Van't Hoff, Sir Wm Ramsay, Sir Wm Crookes, Sir James Dewar, Mme Curie, and Irving Langmuir (qq.v.).

Elementary principles of chemistry. Now to proceed from the general consideration of the science, in the first place we must recognise that to the chemist all matter, solid, liquid, or gaseous, is composed of minute particles called *molecules* (q.v.). The molecules of any substance are all similar. Then, further, molecules themselves are in most cases possessed of a structure. These particles of which molecules are formed are called *atoms* (see ATOM AND ATOMIC THEORY). With this in mind it is now possible to say that any change which leaves the molecules intact is a physical change, while any change in the structure of the molecule itself may be said to be chemical. It is now known that the atom is not the simple, ultimate particle of matter once supposed, but that atoms consist of an electrically positive nucleus, where

resides most of the mass, surrounded by electrons, or units of negative electricity, which revolve and rotate in different orbits, variously inclined to each other, and at different distances from the nucleus. The atom may be roughly compared to a miniature solar system with the nucleus representing the sun. In the case of the lightest element, hydrogen, the atom has the simplest structure, and consists of 1 electron revolving and rotating about the nucleus, while the most complicated structure is presented by the heaviest known element, uranium, the atom of which has 92 electrons. Many names, such as those of Rutherford, Thomson, Lewis, Langmuir, and Bohr, are associated with theories of the structure of the atom, but undoubtedly much work remains to be done. The latest theories are due to Schrödinger, Dirac, de Broglie, Chadwick (qq.v.), and others.

Elements and Compounds. Some molecules contain atoms of the same kind, while others contain atoms of different kinds. Thus, in a molecule of water there are atoms of hydrogen and oxygen, while in that of sulphur all the atoms are alike. When all the atoms are similar, we call the molecule an *elementary* one and speak of the substance as an *element* (q.v.). On the other hand, we speak of the molecule with different atoms as a *compound* molecule, and the substance as a *compound*. Now it is evident that if a substance is composed of more than one kind of matter, i.e. is a compound, it can be built up from the component substances (synthesis), or separated into these simpler substances (analysis or decomposition). If any substance can neither be split up into simpler substances nor built up from them it is said to be an element, and we assume that it consists only of similar atoms. At the present time there are about a hundred elements. It is possible that some of these may, in time, be proved not to be elements, but at present it has not been possible to decompose further any of them, except into electrical particles. The number of compounds is practically infinite, since they consist of combinations of these elements. All substances which are not elements are not necessarily compounds. They may be *mechanical mixtures* (q.v.). Chemical compounds are only produced by *chemical action*, which really consists in the rearrangement of various atoms into new molecules. This may result by: (1) the direct union of 2 molecules to form a more complex molecule; (2) an exchange of atoms between molecules; (3) the rearrangement of atoms within a molecule. As an example of (1) we may take the union of a molecule of carbon with 1 of oxygen to form carbon dioxide; of (2) the union of a molecule of hydrogen with 1 of chlorine, each containing 2 atoms, to form 2 molecules of hydrogen chloride, each containing 1 atom of hydrogen and 1 of chlorine; of (3) ammonium cyanate warmed gives urea. Both contain the same atoms, only in different arrangements, yet their properties are entirely

different. Chemical action may result from a variety of causes. In some cases it is sufficient just to bring 2 substances together. In others heat is required to cause it. Chemical action is always accompanied by the evolution or the absorption of heat. In the latter case, heat must be supplied to the substances to cause the action, e.g. if iron be brought to a dull red heat and it be placed in oxygen, it burns fiercely with the formation of oxides of iron. White phosphorus, on the other hand, combines with the oxygen in the air at the ordinary temp. with the evolution of heat and light. In some cases light is essential to chemical action, as, for example, when chlorine and hydrogen gases are mixed, unless light be given them they will not combine. Photography depends entirely upon the fact of light causing chemical action. Again, in some cases while heat is required to start chemical action, the great evolution of heat in the process is afterwards sufficient to keep the action proceeding, e.g. it is necessary to heat a strip of magnesium in order that it may take fire. Then, however, no further heat is required, the great heat evolved being sufficient to set the strip burning furiously until the end is reached. Pressure also may cause chemical action, e.g. the 2 gases hydrogen chloride (HCl) and hydrogen phosphide (PH₃) will combine to form the solid phosphonium chloride under pressure. Sound also may cause chemical action. An explosion of mercury fulminate causes acetylene gas to break up into the solid carbon and hydrogen gas. A peculiar process of chemical action can only be brought about in the presence of a third substance. In some cases this third substance is known to take a part in the action, while in others its action cannot be traced. In any case, however, that third substance is, at the end, unchanged. This type of action is known as *catalytic* (see CATALYST). Further, some forms of chemical action require moisture. The rusting of iron, or the combination of sodium and chlorine to form common salt, cannot take place in an absolutely dry atmosphere if the substances have also been thoroughly dried.

Chemical symbols. In order that we may shortly express chemical compositions, certain symbols (q.v.) are used to denote the various elements (q.v.). Formulae (q.v.) are used for compounds. By means of formulae chemical reactions can be shortly expressed in the form of an equation (see EQUATIONS, CHEMICAL). They have a quantitative use which will be better understood after a consideration of the laws of chemical combination (see ATOM AND ATOMIC THEORY).

Atomic theory. Dalton connected these laws together and revived the atomic theory. Briefly, it is that matter is made up of minute particles called atoms. Chemical combination takes place between these atoms, i.e. they are drawn and held together by chemical affinity. Should they come into contact with other atoms for which either of the already combined atoms has a much greater

affinity, then a process of redistribution of these atoms will take place. The atoms of different elements are supposed as having different relative weights and these relative weights are supposed as being the same as those numbers which represent their combining proportions. So the equivalent weight of an element is supposed as being its *atomic weight*. Now this theory will satisfactorily account for the laws of chemical combination, and it is a generally accepted fundamental of the science of C. Dalton's theory has to be revised in particular instances. For reasons which need not be given here, the combining proportions of oxygen, carbon, and sulphur, with 1 of hydrogen, are respectively 8, 6, and 16, while in any table of atomic weights the numbers will be 16, 12, and 32.

Chemical combination between gases is governed by 2 laws (see GAS AND GASES), and equations governing any chemical reaction have a quantitative use (see EQUATIONS, CHEMICAL). Among other principles which underly the science may be mentioned that of *valency* (q.v.). The modern electron theory enables us to distinguish (a) positive valency, which represents the number of electrons that an atom—or group of atoms—loses, (b) negative valency, which represents the number of electrons an atom—or group of atoms—gains, and (c) co-valency, which is the sharing of pairs of electrons between atoms. Loss of electrons is characteristic of metallic elements while gain of electrons is characteristic of non-metallic elements.

Periodic system. Chemists divide the whole range of matter into 2 great classes: metals and non-metals (q.v.v.). Thus we could classify elements either as metals and non-metals or according to their valency. But Newlands (1864) developed a system, afterwards improved and established by Mendeleev, now known as the Periodic system. It depends upon the atomic weights of the elements. It can be noticed that if a group of elements be taken which closely resemble each other in their general properties, then the atomic weight of one element will be approximately the mean of the atomic weights of the nearest before and after it, ranged in order of atomic weights: e.g. lithium, sodium, and potassium have atomic weights of 7, 23, and 39. Now $(7 + 39) \div 2 = 23$. If the elements in the various families or groups are arranged in the order of atomic weights it will be seen that the increase in these weights in each group is practically the same. Thus fluorine, chlorine, and bromine have atomic weights of 19, 35.5, and 80, while nitrogen, phosphorus, and arsenic have atomic weights of 14, 31, and 75, and oxygen, sulphur, and selenium are represented by 16, 32, and 79. Now each 3 mentioned together here belong to the same family, and the differences between the atomic weights of the first and second in each group are 16.5, 17, and 16, while between the second and third in each they are 47, 45, 47, and these numbers are approximately equal. This cannot

be pure chance, and Newlands pointed out that if the elements be arranged in order of increasing atomic weights, the properties of the first 7 would reappear in the next 7, so that the first and the eighth, the second and the ninth and so on, would belong to the same group or family. This he called the law of octaves. Mendeleev, as we have before stated, developed this into the periodic law. This, of course, depends upon the hypothesis that the properties of elements are related to their atomic weights. The first 7 elements after hydrogen are lithium, beryllium, boron, carbon, nitrogen, oxygen, fluorine, with atomic weights of 7, 9, 11, 12, 14, 16, and 18. The next 7 are sodium, magnesium, aluminium, silicon, phosphorus, sulphur, and chlorine with atomic weights of 23, 24, 27, 28, 31, 32, 35.5—the approximate difference of 16 being evident throughout—and the element in the second row which corresponds in order with the element in the first row does possess similar properties, and will be found to belong to the same family. As we traverse the rows and pass from lithium and sodium to fluorine and chlorine, we pass from electro-positive soft white metals to electro-negative corrosive gases, while the valency increases as one passes along either row or any succeeding row from 1 to 4 and back again to 1. After the second row, however, the table gets complex, for the next row consists of 17 elements: 7 take their right places under the other 2 rows, then come 3 elements (iron, cobalt, and nickel) which are termed transitional elements, and then 7 others which, while they exhibit certain likenesses to the 7 preceding, can hardly be placed directly under them. These 17 elements are known as a *long period* as against the short period of the sevens. From here on the periods are all long, and should consist of 17 elements, but 2 gaps occur, representing elements of which we yet have no knowledge. The vertical columns in these rows of 7 are taken and the alternate elements after the first 2 rows are placed together and form a family, with similar properties. Thus group 1 will consist of lithium, sodium, potassium, copper, rubidium, silver, caesium, and gold. Of these, copper, silver, and gold form 1 family, and the rest fall together. This periodic table is of the utmost value in the study of inorganic C. It has aided in the true estimation of atomic weights of elements, and has aided in the discovery of new elements; e.g. Mendeleev himself predicted the discovery of an element which he called eka-aluminium, and gave its properties by a study of the series and families in his table. Four years later gallium was discovered by means of the spectroscope (as he had predicted) and justified his predictions completely. A study, however, of a periodic system based upon atomic weights brings out several anomalies; for example, argon and potassium, iodine and tellurium, cobalt and nickel would, judging from their properties and behaviour, be placed in wrong positions if arranged according to atomic weights.

For long this remained unexplained, but it is now known that the atomic number (see ATOM) of an element is of more fundamental importance than its atomic weight. The above anomalies disappear when the elements are arranged according to their atomic numbers.

Isotopes (q.v.). The discovery of radium and the phenomenon of radioactivity, which revealed the startling fact that the atoms of certain heavy elements, such as uranium, thorium, and radium, were undergoing spontaneous disintegration, led Soddy (1910) to suggest that elements might exist which were chemically identical but differed in atomic weights ('isotopes' or 'isotopic elements').

Atomic numbers. Kaye (1909) found that a solid element, when bombarded by a rapid stream of cathode rays, emits a characteristic X-radiation, which may be resolved into a spectrum by reflection from a crystal, because as shown in the classical researches on crystal structure by the late Sir W. H. Bragg, and his son Sir Laurence Bragg, the internal surfaces of crystals act as diffraction gratings towards X-rays. Moseley (1913-14) used a crystal of potassium ferrocyanide and photographed the spectra of various elements. In this way he obtained what are known as the atomic numbers of the elements. These are whole numbers and when the elements are arranged according to them the periodicity of properties is shown without any anomalies. Briefly defined, the atomic number of an element is numerically equal to the charge on the nucleus of its atom.

Chemical nomenclature. If a substance is a *binary compound*, i.e. is composed of 2 different elements, then its chemical name is made up from the names of its composing elements, e.g. when hydrogen and sulphur enter into chemical combination the resultant substance is termed hydrogen-sulphide. Sometimes, however, the same 2 elements will combine together in more than 1 proportion. Names are then necessary to distinguish 1 from the other. Prefixes or terminal endings are used for this purpose. Phosphorus unites with either 3 or 5 atoms of chlorine, when it is known as phosphorous or phosphoric chloride according as there are 3 or 5 atoms of chlorine in the compound. Another and perhaps better method is that by which it is known as phosphorous trichloride or phosphorous pentachloride. The latter is the more general method. *Sub-* and *pro-* were terms generally in use, but they have fallen into disuse. When oxygen is 1 of the 2 elements in the compound, the substance is known as an oxide. Some of these oxides, when combined with water, form acids, and are known as acid-forming oxides or anhydrides. All the non-metallic elements except hydrogen form these oxides, and the so-formed acids are called oxyacids. Metals give rise to oxides which form hydroxides with water, and these oxides are called basic oxides. When an acid is brought into contact with a basic oxide a salt is formed. All oxides are named after the substance with which

the oxygen is united, and oxyacids are also named after the same substance. Thus carbon dioxide gives rise to carbonic acid. When a substance forms 2 acid-forming oxides the terms *ic* and *ous* are used to denote the one with the greater and the lesser amount of oxygen respectively. Thus sulphur trioxide forms sulphuric acid, while sulphur dioxide forms sulphurous acid. Acids used to be considered as always containing oxygen, but this view is incorrect, as can easily be seen from the fact that chlorine,

Organic and inorganic chemistry. Organic C. (q.v.) is the C. of the carbon compounds. The element carbon is unique in its remarkable power of forming compounds, principally with hydrogen, or hydrogen and oxygen. The special branch of organic C. is necessary on account of their great and increasing number. The term 'organic' has lost its original significance, that of bodies which could only be produced by the so-called 'vital force' in living matter. That view was practically overthrown in 1828,



Imperial Chemical Industries

PLASTICS: AN ACHIEVEMENT OF MODERN CHEMISTRY

One of the most interesting and important of the synthetic plastics is the acrylic resin 'Perspex,' made by chemical reactions between acetone, hydrocyanic acid, wood alcohol or methanol, and sulphuric acid.

The photograph shows 'Perspex' cocktail-glasses.

fluorine, bromine, and iodine, known in C. as the halogen group, form acids when in combination with hydrogen. When acids are added to bases, salts are formed, and acids which contain more than 1 atom of hydrogen (all acids have, at least, 1 atom) can form more than 1 salt, for a salt is formed by the replacement of the atom or atoms of hydrogen in the acid by the metallic atoms of the base. Thus sulphuric acid (H_2SO_4) contains 2 atoms of hydrogen, and it can give rise to 2 salts of any metal, e.g. normal potassium sulphate represented by K_2SO_4 and KH_2SO_4 . Hydrochloric acid, on the other hand, has only 1 atom of hydrogen in it, and can only give rise to 1 salt. Thus according as there are 1, 2, 3, or 4 atoms of hydrogen in an acid, it is known as mono-, di-, tri-, or tetra-basic, while a normal salt is 1 in which all the displaceable hydrogen atoms have been replaced by the base.

when Wöhler synthesised the organic body urea from the inorganic compound ammonium cyanate. A phenomenon found with extraordinary frequency in the case of carbon compounds is that known as 'isomerism' (q.v.).

Physical chemistry. Although of very recent development this is now an absolute essential to the study of any branch of C. with any design. It seeks to explain processes, and to formulate laws for these processes, and is divided within itself again into electro- and thermo-C., etc. One branch of physical C. in which great strides have been made is the study of the general properties of gases. It is really as much in the realm of physics as it is in the realm of C. (see GAS AND GASES). A further dept of physical C. which has received great attention is that of the theory of solutions. It has been established that the pressure exerted by a substance in dilute solution, its osmotic pressure

(see Osmosis), is the same as would be exerted by the same amount of the substance if it existed as gas, and occupied the same volume at the same temp. Much research has been carried out on what is known as the colloidal state (see COLLOIDS). This may be regarded entirely from the point of view of size of particle. The particles are of greater molecular dimensions than exist in true solutions, and yet sufficiently small to be kept in suspension, against the action of gravity, by molecular bombardment. Such particles represent an enormous surface area and to this fact many of the properties characteristic of the colloidal state are due. Further the laws relating to gaseous pressure are similar to those relating to osmotic pressure, and diffusion of dissolved substances can be compared with the diffusion of gases, although it is a much slower process. This theory involves the theories connected with electrolysis (q.v.), for solutions of some substances act in such a manner that it is necessary to suppose that molecules of the dissolved substances unite in solution to form complicated molecular structures, while in the case of certain acids, bases, and salts, their resultant action can only be explained on the hypothesis that their molecules dissociate into ions. Dissociation (q.v.) is a term used of reversible reactions. The conception of ions in C. is a branch of electrolysis (q.v.). It will be sufficient for the purposes of this article to mention that the theory of electrolytic dissociation at present held is that it involves a flow of electrons. The primary factors in electrolysis are known as *ions*. Those which proceed to the positive pole are negatively charged, and vice versa. Among electronegative ions may be named fluorine, chlorine, bromine, and acidic radicals such as SO_4 , while electro-positive ions include hydrogen and the metals. Among the laws of electrolysis may be mentioned Faraday's, which says that if the same quantity of electricity be passed through different electrolytes, then the ratio between the liberated products of the electrolysis is the same as that between their chemical equivalents. It used to be supposed that the electricity caused the dissociation of the electrolyte into ions, but it has been shown that electricity travels as freely through electrolytes as along metals, and that consequently work is not done. Arrhenius (1887) proposed that some of the molecules of an electrolyte are always in a state of dissociation (q.v.). A development of this theory leads to the conclusion that a solution, say, of sodium chloride has sodium and chlorine existing in the free state within the solution. This goes against all preconceived ideas, particularly as sodium causes immediate chemical action if brought into contact with water. To support this theory, however, they must be in such a state and highly charged with electricity. Whenever they lose their charges they either reunite into sodium chloride or form molecules of sodium and chlorine and assert their usual properties. It is now

believed that electrolytes consist not of molecules but of assemblages of ions, even in the solid state. Solution merely sets the ions free to move, and passage of a current directs their movement. Thermo-C. is concerned with the thermal changes which accompany chemical changes. Determinations in this branch of the science are made by means of calorimeters in which the heat that is liberated in chemical action is transferred to definite volumes of water, and its application chiefly lies in its efficacy for determining economic commercial processes. The structure of the atom is, of course, of fundamental interest and importance to C., but the methods employed in this study are almost entirely physical. Finally, it may be stated that a knowledge of C. is evidently essential in many walks of life, whether it be the surgery, the kitchen, the dairy, the farm, the factory, the mine, or the great iron and steel industries. The arts and, of course, the great chemical and dye works are dependent upon it, and it stands out as the first study in any scheme of technical education.

Bibliography. BEGINNERS: A. J. Mee, *A Modern Chemistry* (11th ed.), 1956; E. J. Holmyard, *A Junior Chemistry* (11th ed.), 1957. MORE ADVANCED: T. Thomson, *History of Chemistry*, 1830-1; H. Watts, *Dictionary of Chemistry*, 1870-81, 1888-1898; Sir W. Crookes, *Select Methods of Chemical Analysis*, 1871; W. Ostwald, *Lehrbuch der allgemeinen Chemie*, 1885-7, 1891; Sir T. E. Thorpe, *Dictionary of Applied Chemistry*, 1891-3, 1921-7; J. W. Mellor, *A Comprehensive Treatise on Physical and Inorganic Chemistry*, 1922-1937; W. C. McC. Lewis, *System of Physical Chemistry*, 1924-32; E. J. Holmyard, *Makers of Chemistry*, 1931; J. Read, *Prelude to Chemistry*, 1936; J. R. Partington, *A Text-book of Inorganic Chemistry*, 1937; P. Karrer, *Text-book of Organic Chemistry*, 1939; A. I. Vogel, *Quantitative Inorganic Analysis*, 1939; F. S. and F. B. Kipping, *Perkin and Kipping's Organic Chemistry*, 1939-41; F. W. Aston, *Mass Spectra and Isotopes*, 1942; E. J. Holmyard and W. G. Palmer, *Higher School Inorganic Chemistry* (11th ed.), 1956; F. A. Philbrick, E. J. Holmyard, and W. G. Palmer, *A Text-book of Theoretical and Inorganic Chemistry* (8th ed.), 1956.

Chemnitz, Bogeslaw Philipp von (1605-1678), Ger. historical and political writer, grandson of Martin C. (q.v.). He was an officer in the service of Sweden during the Thirty Years War, becoming historiographer to Queen Christina in 1644, councillor in 1675. His *Dissertatio de ratione status in imperio nostro romano-germanico* appeared in 1640 under the pseudonym of 'Hippolytus a Lapide.' C. also wrote *Der königlich schwedische in Deutschland geführte Krieg*, 1648 (new ed., 1855-9). The *De Ratione* was answered by an anonymous writer, 1657; by Bruggemann, 1667; and Boecler, 1674. It was trans. into French by de Chastelet, 1712; by Formey, 1762.

Chemnitz, or Kemnitz, Martin (1522-

1586), Lutheran divine, son of a cloth-worker, b. Treuenbrietzen, Brandenburg; followed his father's trade, but became a student at the univ. of Frankfurt-on-Oder, and then at Wittenberg, where he came under the influence of Luther and Melancthon. He won notice as an orator and controversialist. Bitterly opposed to the Jesuits, he inveighed against them in many pamphlets, especially in his *Theologiae Jesuitarum praecepta capita* and *Examen concilii Tridentini*, 1563-73. He was recognised as the head of his church throughout Saxony.

Chemnitz, see KARL-MARX-STADT.

Chemosh, national deity of Moab, called by the Israelites the 'Abomination of the Moabites' (1 Kings vii. 7). The latter were also called the children of C. (Jer. xlviii. 46). C.'s name frequently occurs in the O.T. (cf. Judges xi. 24), and is found on the Moabite stone (q.v.). Human sacrifices were sometimes offered to him (2 Kings iii. 27). Solomon built an altar to him, which was not removed until Josiah's accession.

Chemotaxis, see FERTILISATION.

Chemotropism, see TROPISM.

Chemulpo (Kinsen), port on the W. coast of Korea, was opened to foreign trade in 1883 when it was a poor fishing vil.; it was later a flourishing and rapidly increasing centre of trade with a pop. of 103,000 (Japanese 25,000).

Chemung, name given by Amer. geologists to a div. of the Devonian.

Chenab, riv. of Kashmir, India, and E. Punjab, Pakistan. Together with the Sutlej, Beas, Ravi, and Jhelum it forms the R. Punjab or Panjnad (Five Waters), which finally flows into the Indus. When the C. reaches the Punjab dist., it attains to a breadth of 600 ft. It takes its rise in Lahul at an altitude of nearly 14,000 ft. It is 590 m. long.

Chencanfu, tn of Kwangsi prov. in S. China.

Chenchine, see FET.

Chenchow, or **Yuanling**, tn of central China, Hunan prov., on the Yuankiang, 169 m. W. of Changsha, 110 m. from Lake Tungting.

Chenchu, an aboriginal people of S. Hyderabad in India. They are divided into 3 groups: (1) The 'Jungle C.s.' who rely mainly on the gathering of wild forest produce and are largely nomadic, are the most important. There are also (2) C.s. living in settled vils., who have adopted the type of life of their Hindu neighbours; and (3) a third section in Madras, now settled in permanent vils. See C. Fürer-Haimendorf, *The Chenchus*, 1943.

Chénédollé, Charles Julien Lioult de (1769-1833), Fr. poet who fought in the army of Condé against the revolutionaries. His prin. works are *Le Génie de l'homme*, 1807, and *Études poétiques*, 1820. He belonged to the romantic school of poets, and his works were ed. by Sainte-Beuve in 1864, who has also paid tribute to his memory in his *Chateaubriand et son groupe*, 1860.

Chénés, tn situated near the conjunction of the R.s Ourthe and Vesdre in the prov. of Liège, Belgium. Pop. 11,300.

Chenery, Thomas (1826-84), Brit. scholar and journalist, b. Barbados. Educ. at Cambridge, he was called to the Bar and later was *The Times* correspondent in the Crimean War. A fine Hebrew and Arabic scholar, he was on the revision committee of the O.T. and from 1868 to 1877 was prof. of Arabic at Oxford. Thereafter, till his death, he was editor of *The Times*.

Chenovix, Richard (1774-1830), Irish writer, chemist, and mineralogist, of Fr. parentage, F.R.S. of London and Edinburgh. He was a Copley medalist in 1803. Among his scientific works are *Chemical Nomenclature*, 1802, and *Observations in Mineralogical Systems*, 1808. He also wrote the comedy *Mantuan Revels*; the tragedy *Henry VII*, 1812; *Essay on Natural Character*, 1830; papers on palladium, nickel, and platinum; *Leonora*, and other poems.

Chengchow, cap. of Honan prov., China, 80 m. from Kaifeng, in the cotton-growing dist. It is the junction of 2 main arterial roads, the Peking-Hankow and the Lung-Hai. The latter is now being extended to Russia. C. used to be an industrial centre of Honan. Since 1950 many of the textile mills in Shanghai have moved to C. and more mills were built here in 1954-6. It was made cap. of Honan in 1951, and a new univ. has been estab. there. Pop. approx. 1,000,000.

Chengteh, tn of inner Mongolia, 115 m. NE. of Peking. Under the Manchu dynasty it was the summer resort of emperors. From 1913 to 1953 it was the cap. of Jehol prov. The palaces and lama temples built in 1703 by Emperor Kanghsi are comparable in grandeur and beauty with those in Peking. C. is the military junction of the Peking-Chengteh and Chaoyang-Chengteh railways. Pop. approx. 50,000.

Chengtu, cap. of prov. of Szechuan, W. China, situated in a fertile plain watered by the Min, a trib. of the Yangtse. It is an important railway centre and the seat of the Szechuan Univ. Rice and silk are its chief products. Its Takiangyen dam and irrigation system, built in the 3rd cent. BC, are in good repair. The temples of the poet Tu Fu and many other historical celebrities are the pride of C.

Chengyangkuan, tn in the prov. of Anwei, China; noted for its market.

Chénier, André Marie (1762-94), Fr. poet and miscellaneous writer, son of the Fr. consul at Constantinople, his mother being Greek. He was educ. at the Collège de Navarre, and began to write verse at the age of 16, with imitations of Homer and Virgil. He held at one time a commission in the army, but soon devoted himself to literature. He wrote many idylls and elegies, which show his powers as poet, although little was pub. during his life-time. Singularly chaste in style, he approached the Greeks in their powers of eloquence and choice selection of words. He was largely influenced by Milton, whose classic style he sought to imitate. In 1787 he accepted a post in the Fr. embassy in London, but after 3

years returned to France, where, after joining the revolutionary movement for a short time, he threw in his lot with the Moderate party, being disgusted with the extreme methods adopted by the revolutionaries. Most of his political writings appeared in the *Journal de Paris*. When his party was defeated and the king executed, he paid for his outspokenness, was arrested and thrown into the St Lazare prison, and guillotined 4 months later. C. is regarded as the foremost Fr. poet of the 18th cent. A classicist, he differed only from the great classicists in that he was more of a Hellene than they—a trait which he owed to his Gk mother's influence. The only long works he projected were in the spirit of the 18th cent.

Dimoff, *La Vie et l'œuvre d'André Chénier*, 1936; G. Walter, *A. Chénier, son milieu et son temps*, 1947.

Chénier, Marie Joseph Blaise de (1764–1811), Fr. dramatist and poet, younger brother of André. He was a Jacobin, and served in the legislative assembly for a period of 30 years. C. was a keen politician with democratic principles, which account largely for the popularity of his tragedies, chief of which are his *Charles IX*, 1790, *Henry VIII*, 1791, *Jean Calas*, 1791, and *Timoléon*, 1794. He became a member of the Convention, and was on the Council of Five Hundred. He was distinguished for his satires, amongst which may be mentioned his *Épître à l'olâtre*, 1806.



D. McLeish

THE CHÂTEAU OF CHENONCEAUX

and belonged to the Encyclopaedic movement. The best known of his poems belong to the *Bucoliques*: *La Jeune Tarentine*; *L'Aveugle* (on the legend of Homer wandering and blind); and *Le Jeune Malade*. Of the odes the best known are the Pindaric *Jeu de Paume* and one addressed to Charlotte Corday. The *Iambes*, which contain some of his finest poetry, were all written during his incarceration in St Lazare. In style his importance lies in his use of *enjambement*, and he was the first who in this manner systematically modified the somewhat monotonous uniformity of the Alexandrine so as to lend it more life and flexibility. His works on scientific questions or current problems include *L'Amérique* (planned as a poetic geography of the known world); *L'Hermès* (a universal philosophy in verse); *L'Astronomie*; *La Superstition*; and *L'Invention*, later works which show a deeper skill in literary craftsmanship. His *Poésies lyriques* were pub. after his death in 1819. See E. Faguet, *A. Chénier*, 1902; P.

Chenille, special kind of pile yarn used in millinery manuf., curtains, and carpets. It may be of silk or worsted according to the purpose required. It is made by weaving a gauze cloth of very open texture which is then cut into strips and finished off into a rounded-pile thread.

Chenkiang, port in the Kiangsu prov. of China, on the S. bank of the Yangtse, about 150 m. from its mouth. Its existence as a port is gravely threatened by the deterioration of the harbour. Pop. 200,000.

Chenonceaux, Fr. vil. in the dept of Indre-et-Loire, 22 m. E. of Tours (q.v.), on the Cher. It is famous for its magnificent Renaissance chateau, which is constructed over the riv. The building was begun by Thomas Bohier, a tax collector, in 1515. The great gallery, 199 ft long, which crosses the Cher, was added by Philibert Delorme (q.v.) in 1560. The chateau, confiscated by Francis I in 1535, was given by Henry II to Diane de Poitiers, from whom it was forcibly taken by Catherine de' Medici (qq.v.) in exchange

for Chaumont (q.v.). Later it was possessed by the Vendôme and Bourbon-Condé families.

Chenopodiaceae, family of Dicotyledons, contains over 500 species many of culinary value. Many grow on salt or alkaline soils, and frequent seashores. Most of the plants are herbaceous, with dense inflorescences of small flowers. There is usually a simple, persistent perianth of sepaloid leaves, 1 to 5 in number, the stamens typically equal the perianth-leaves in number, the ovary is superior and unilocular with a single campylotropous, basal ovule; there are no stipules, and the fruit is a nut or an achene. Genera include *Atriplex*, *Beta*, *Chenopodium*, *Grayia*, *Halimolobos*, *Sarcocolla*, and *Spinacia*.

Chenopodium, important genus of the Chenopodiaceae, of about 110 species of temperate regions. Among those found in Britain are *C. bonus-henricus*, All-good, Mercury, or Good King Henry, a perennial with edible shoots like asparagus; *C. polyspermum*, All-seed; *C. vulgare*, Stinking Goosefoot; *C. ficifolium*, Fig-leaved Goosefoot; *C. murale*, Nettle-leaved Goosefoot; *C. urbicum*, Upright Goosefoot; *C. rubrum*, Red Goosefoot; *C. glaucum*, Glaucous Goosefoot; *C. album*, Fat Hen; and *C. hybridum*, Sowbane—all annuals. *C. quinoa*, the annual Quinoa of Peru, yields very large seeds used for food, growing where other cereals do not ripen; *C. ambrosioides* is the annual Mexican Tea, and its variety *anthelminticum*, Wormseed, provides an essential oil used as a vermifuge; *C. capitatum* is the Strawberry Blite of Europe, with bright red seeds; and *C. amaranticolor* is often used in S. France as a substitute for spinach.

Chenyuen, tn in the prov. of Kweichow, China, 100 m. ENE. of the cap., Kweichow. It is noted for its gold and copper mines. The volume of trade transacted in C. is about one-third of that of the whole prov.

Cheops, Khufu, second king of the 4th Dynasty of Egypt, and the builder of the Great Pyramid of Giza. The construction of this great tomb and that of his successor, Cephren, exhausted Egypt. According to Herodotus, all the Egyptians were put to work in relays of 100,000 working for 3 months, quarrying, constructing the road for transport, and preparing the site. All this work took 10 years, and the work of building the pyramid 20 years more.

Chepman, Walter (c. 1473-c. 1538), printer and merchant of Edinburgh, one of the first Scottish printers. He was introduced to the court of James IV, and was trained as a clerk and writer under Panter, the royal secretary. C. and Andrew Myllar were granted the sole patent to print books in Scotland, 1507. They set up their printing-press (the first in Scotland) at the foot of Blackfriars Wynd in the Cowgate, Edinburgh. Two of their pubs. remain, one, the first book printed in Scotland, consisting of 11 small quartos bound together, 1508, the other *Breviarium Aberdonense*, 1510. See introduction by D. Laing, *The Chepman and Myllar Prints, 1508, 1510*,

and R. Dickson, *Introduction of the Art of Printing into Scotland, 1885*.

Chepping Wycombe, see WYCOMBE, HIGH.

Chepstow, tn of Monmouthshire on the R. Wye, near its junction with the Severn. The tn lies on a slope between steep cliffs, and is surrounded by beautiful scenery. It possesses the ruins of a castle which sustained sev. sieges during the Great Rebellion, and in its neighbourhood are the remains of the famous Tintern Abbey. The Wye is crossed near here by Brunel's tubular suspension bridge, and here occur the highest tides in the Brit. Isles, the water sometimes rising 70 ft above low level. It is a holiday centre for the Wye Valley and the Royal Forest of Dean. Pop. 5473.

Cheque, money order on a banker drawn out by a person who has money in the bank, and payable on presentment by the person to whom the C. is written out or by the bearer. The rules with regard to a bill of exchange (q.v.), defined in the Bill of Exchange Act, 1882, are also applicable to C.s. A C. must bear a two-penny stamp, and must be signed by the drawer, and presented within a reasonable time. A banker who pays a forged C. cannot debit his customer with the amount. When the amount is fraudulently altered, the banker who pays it can recover from his customer only the amount originally placed on the C. Negligence on the part of the customer causing or giving facilities for fraud may excuse the banker, if it be gross; but merely leaving one's C. book in an unlocked drawer will not *per se* be sufficient for this. Bankers paying on forged endorsements stand on somewhat different footing. A banker who pays in good faith and in the ordinary course of business a C. on himself to order on demand, bearing a forged endorsement, will not be held liable to his customer for the amount (Section 80, Bills of Exchange Act, 1882—a section which protects only bankers). The banker is bound to pay the C. on demand, except in cases when the drawer has previously given notice to him not to pay on his account, or when the drawer has d. or committed an act of bankruptcy. In England C.s may be crossed in order to lessen the risk of loss by theft or fraud.

A *crossed C.* has 2 parallel lines drawn across it, in which may be written a particular banker's name, or merely the words '& Co.' In the former case it is said to be *specifically* crossed, and will only be paid through the banker mentioned. When it is *generally* crossed, it is payable only through a bank. If the words 'not negotiable' are added, the person taking the C. does not have and cannot give a better title to it than that of the person from whom he took it. C.s are returned by the banker after payment to the person who originally drew them. Since 17 Oct. 1957 the endorsement of C.s by payees has been unnecessary. By the Cheques Act, 1957, an unendorsed C. which appears to have been paid by the drawer's banker is evidence of receipt by the payee of the sum payable by the C.

Chequers, popular name for C. Court, a country mansion and estate in Bucks, England, the official country residence of Brit. Prime Ministers. The house is situated in a sheltered hollow of the Chiltern Hills at just over 600 ft above sea level, and its grounds contain Coombe Hill, 852 ft, one of the highest points in the Chilterns. The estate, which lies near Princes Risborough, is about 38 m. from London, and contains 1500 ac. of farmlands and woods. The nation owes this picturesque and historic mansion to the munificence of Lord Lee of Fareham, who in 1917, when Sir Arthur Lee, M.P., created a trust for the upkeep, staffing, etc., of the house and estate for the use, on his death, of Brit. Premiers. In 1920 he decided not to await that event, and on 8 Jan. 1921 Mr Lloyd George first occupied the residence. The mansion dates from the 15th cent., and contains a collection of Cromwell portraits and relics.

Cher: 1. Fr. riv., rising near Aubusson, and flowing generally NW. to join the Loire about 12 m. below Tours. It is navigable from Vierzon. Length about 220 m.

2. Dept of central France, formed from part of the anc. prov. of Berry and a small part of Bourbonnais. The climate is temperate, the surface generally level and well wooded. The soil is fertile, and corn, vines, fruit-trees, beet, hemp, and flax are produced. Livestock is raised, and there is much bee-keeping. The chief occupation is agriculture, but there are some manufs., including woollen goods, cutlery, porcelain, glass, and confectionary. The prin. tns are Bourges (the cap.) and St-Amant-Mont-Rond (q.v.). Area 2819 sq. m.; pop. 284,400.

Cherasco, It. tn in Piedmont (q.v.) on the Tanaro. An armistice was signed here in 1796 between Napoleon (q.v.) and the Piedmontese. There is a silk industry. Pop. 9000.

Cherbourg, fortified seaport tn and naval station in the dept of Manche, France, situated at the head of the peninsula of Cotentin, 85 m. W. of Havre. It has tribunals of the first class, and is the seat of a sub-prefecture. It is the H.Q. of one of the 5 naval arrons. of France, and possesses a lycée and a naval school. Its prin. industry is centred in the works of the dockyard, but there are manufs. of hosiery and lace, chemicals and leather, as well as sugar and salt refineries, sawing, and flour mills. Nothing certain is known of the origin of C., but a common supposition is that it occupies the site of the Rom. station of *Coriallum*, and the name C. was long regarded as a corruption of Caesaris Burgus. The tn certainly existed in the 10th cent. In the 11th cent., under the name of Carusbur, it was a favourite resort of the Norman kings of England. In 1686 Vauban planned the harbour works, which were continued under Napoleon I, but not finally completed until 1856, when they were formally inaugurated by Napoleon III in the presence of Queen Victoria. Thirty years later the gov. expended 49,000,000 francs on the construction of

fresh works. The commercial and naval ports are quite distinct from each other. The latter consists of 3 basins cut out of the rock, 55 ac. in area with a minimum depth of water of 30 ft. Adjoining are dry docks and some of the largest ship-building yards in France. The bay is sheltered on the N. by a huge *digue*, or breakwater, 2½ m. from the harbour, over 2 m. long, 650 ft wide at its base, and 30 ft at its summit. The passages for vessels on the E. and W. of the *digue* are protected by batteries, the chief being Fort National with 100 guns on the Ile de Pelée, and there is a fort in the centre of the breakwater. A series of coast redoubts and large fortifications behind this outer ring of defence renders C. almost impregnable from the sea. In the Second World War the Port Militaire and the Gare Maritime were heavily damaged, and the naval arsenal completely destroyed. The Allies captured C. by a land attack up the Contentin Peninsula. Americans entered C. on 25 June 1944. Pop. 40,000. See further under WESTERN FRONT in SECOND WORLD WAR, *Battle of Normandy*.

Cherbuliez, Charles Victor (1829-99), Fr. novelist, b. Geneva. He studied philosophy, philology, and mathematics. He was first a teacher, and afterwards wrote, besides his works of fiction, critical essays on various topics. His novels are a blend of narrative and philosophic reflection, and the amusing, if eccentric, originality of their style appealed to a large class of readers. Some of his most popular novels are *Le Prince Vitale*, 1864, *Samuel Brohl et Cie*, 1877, *Noirs et rouges*, 1880, and *Le Secret du précepteur*, 1893, most of which appeared in the *Revue des deux Mondes*. He also contributed political and serious articles, such as *L'Art et la nature* and *L'Espagne politique*, 1874. His works were very popular in other countries. He was made member of the Fr. Academy in 1881. See A. Célières, *V. Cherbuliez*, 1936.

Cherchel, see CAESAREA.

Cherdyn', tn in the Perm' Oblast of the Urals, 170 m. N. of Perm'. Pop. (1932) 5000. It was the old cap. of the N. Urals (until 1708; Komi (q.v.) princelings till 1505, under Moscow from 1472).

Cheremisses, see MARI.

Cheremkhovo, tn in the Irkutsk Oblast of SE. Siberia, 80 m. NW. of Irkutsk on the Trans-Siberian Railway. C. is the centre of the C. coal basin which stretches 300 m. along the Trans-Siberian from Nizhneudinsk to Lake Baykal. It is the second centre of the Irkutsk-C. industrial area. Pop. (1956) 114,000 (1926, 14,000; 1939, 66,000).

Cherepovets, Russian tn in Vologda Oblast, 72 m. W. of Vologda, on the Rybinsk Reservoir (q.v.). It was founded in 1780. It has iron and steel plants (Murmansk ore, Vorkuta coal, scrap) and is a transportation centre (railway, Marinsky Water Way, q.v.). Pop. (1956) 73,000.

Cherethites and Pelethites, foreign mercenaries forming the royal bodyguard of King David, and probably Philistines

(q.v.). The Gittites, who were Philistines, were coupled with them. C. is another form for Cretans, and the Philistines came from Caphtor, which is identified with Crete. The Carites (a scribal error for Cherethites) brought about Athallah's downfall, and made Joash king. The C. were settled in the Negeb (I Sam. xxx. 14).

Cherhill, par. of Wilts, England, 10 m. W. of Marlborough. It is noted for its old Tithe Barn, and for the White Horse cut out on the Downs, which together with the lofty Lansdowne Monument above forms a noted landmark. Pop. 367.

Cheribon, tn of Java, Indonesia, on the Java Sea, 125 m. S.E. of Jakarta. A manufacturing centre (chemicals, textiles, tobacco). C. also exports sugar, rice, and copra. Pop. 54,000.

Cherimoyer, or **Cherimola**, edible fruit of a Peruvian, downy-leaved, evergreen tree, *Annona cherimola*, closely allied to the custard-apple of the W. Indies. The fruit is much esteemed by the people of the W. parts of S. America. Its cultivation has spread to Central America and to Europe, India, and Africa.

Cherith, Brook of, the brook 'before,' i.e. E. of, the Jordan (I Kings xvii). It was Elijah's hiding-place during the first part of the 3 years' drought.

Cheriton, par. of E. Kent, England, now forming part of the bor. of Folkestone (q.v.).

Cherkassy: 1. Oblast in central Ukraine, S. of Kiev, situated largely on the r. b. of the Dnieper, in the wooded steppe, black earth belt. Pop. (1956) 1,500,000, almost entirely Ukrainian (before the war also Jewish). Sugar-beet and wheat are grown, and hogs and cattle raised for milk and meat; there are also food industries. The area belonged to the medieval Kiev state; in 1362 it became Lithuanian, in 1569 Polish, and in 1793 Russian.

2. Cap. and an economic and cultural centre of the above, on the Dnieper, 96 m. S.E. of Kiev. Pop. (1956) 62,000 (1897, 30,000; 1926, 40,000; 1939, 52,000). It was probably founded at the end of the 13th cent.; 1386-1649, cap. of the Ukrainian hetmans (q.v.).

Cherkesses, see CIRCASSIANS.

Cherkessk (formerly **Batalpashinsk**, in 1930's **Sulimov**, **Yezhov-Cherkessk**), tn in the Stavropol' Kray of N. Caucasus, 60 m. S. of Stavropol', cap. of the Karachay-Circassian Autonomous Oblast (q.v.). Pop. (1956) 37,000, predominantly Russian and Ukrainian. It was founded in 1803 as a Cossack vil., and has been a tn since 1880.

Cherleria, genus of Caryophyllaceae, of which one species, *Ch. sedoides* (synonym *Aleine cherleri*), the Mossy Cyphal, a perennial herb, is found on Scottish mts.

Chermes, see ADELGES.

Chernigov (Ukrainian **Chernihiv**): 1. Oblast in N. Ukraine, N.E. of Kiev, situated in the Poles'ye (q.v.), and partly covered with mixed forests. Rye, wheat, and potatoes are grown, and hogs and cattle raised for milk and meat; there are

lumbering, peat-cutting, and food industries. The prin. tns are C. and Nezhin. The area belonged to the medieval Kiev state, then variously to Russia and Lithuania-Poland; in 1654 it finally became Russian. Area 12,200 sq. m.; pop. over 1,500,000, almost entirely Ukrainian (before the war also Jewish).

2. Cap., economic and cultural centre of the above, on the R. Desna, 78 m. N.E. of Kiev. It has sev. 11th-12th-cent. churches and interesting 17th-cent. buildings. It was the main tn of the Severyane tribe from the 7th cent.; from 1024 to 1239 it was cap. of C. Grand Principality stretching to the Oka and the N. Caucasus. Pop. (1956) 74,000.

Chernikovsk, former city in the Urals. It originated in the 1930's as an industrial suburb N.E. of Ufa where most of Ufa's industries were concentrated. It was made a separate tn in 1944, but again fused with Ufa in 1956. Pop. (1956) 206,000.

Chernov, Viktor Mikhaylovich (1873-1952), Russian politician, leader of the Socialist Revolutionaries (q.v.), occupying a central position in the party. In 1917 he was minister of agriculture in Kerensky's provisional gov.; in 1918 he was elected chairman of the Constituent Assembly. He emigrated in 1920 and lived in America. See his *The Great Russian Revolution*, New Haven, 1936.

Chernovitsi, or **Chernovitsy**, see CHERNOVITSY.

Chernovtsy: 1. Oblast in W. Ukraine, comprising N. parts of Bukovina and Bessarabia, lying in the Carpathian foothills, traversed by the R. Prut and partly covered by beech forests. It has wheat and sunflower growing, sheep raising, lumbering and woodworking, and food industries. For its hist. see BUKOVINA and Bessarabia. Area 3200 sq. m.; pop. (1956) 767,000, mostly Ukrainians.

2. (Ukrainian **Chernivtsi**, Rumanian **Chernauti**, Ger. **Czernowitz**, Russian **Chernovitsy** until 1944) Cap., economic and cultural centre of the above, on R. Prut. It has textile, engineering, and food industries. There is a univ. (1875). J. has been known since 1407, became a tn in 1786, and cap. of Bukovina in 1849. From the late 19th cent. it has been a centre of the Ukrainian national movement. Pop. (1956) 142,000 (1930, 111,000), Ukrainians and Jews.

Chernyakhovsk, see INTERBURG.

Chernyshevskiy, Nikolay Gavrilovich (1828-89), Russian publicist and literary critic, the leader of the Radical intelligentsia in the 1850's and 60's; he spent 19 years in banishment in Siberia. His dissertation *The Aesthetic Relations of Art and Reality*, with its strictly utilitarian view on art, his many articles (1854-64) in the Radical monthly *The Contemporary* (q.v.), his novel *What is to be Done?* and his *Notes on J. S. Mill's Political Economy* laid the foundations of revolutionary Populism (see POPULISM), prepared the ground for Marxism in Russia, and provided an important element of the Bolshevik ideology.

Cherokees, tribe of N. Amer. Indians of

the Iroquoian language stock, numbering 45,000. They formerly possessed a large tract of land on either side of the S. Appalachian Mts. They sided with the English in most of the disputes between the European colonists and with the Royalist party in the revolutionary war. The failure of the Royalist party led to their subjugation by the new rep. and the loss of a large part of their ter. The increasing number of white settlers led to disputes with the original owners of the land, and those who had not already moved were driven, in 1838, to their present position in the N.E. corner of Oklahoma, while others live in Tennessee. The C. have a written alphabet of 85 characters invented in 1821 by George Guess, or Sequoyah, a half-breed. Until 1906, when they disbanded as a tribe to become U.S. citizens, they had a constitutional gov., consisting of an elected chief, a senate, and a house of representatives.

Cherrapunji, vil. in Assam state, India, in Khasi Hills. It has the heaviest known ann. rainfall in the world, the average being 426 in. per annum. In 1861 the total recorded for the year was 905 in., of which 366 in. fell in the month of July.

Cherry. *Prunus cerasus* is the Sour C., and crossing with *P. avium*, the Wild C.; has given the Duke or Sweet C.s; family Rosaceae. The C.-trees differ from the plum-trees very slightly, and there is little to distinguish them from one another beyond the folding of the leaves in the bud—in the C. they are flat, in the plum rolled up. The fruit in both cases is stony and is termed technically a drupe. From early times the C. has been cultivated for its edible fruit, and Lucullus, the epicure, is said to have brought it into Europe. *P. chamaecerasus*, the ground C., a dwarf species, never rising above 3 or 4 ft high, is common to Lower Austria, Hungary, and Siberia; *P. nigra*, the black Amer. C., is a handsome tree with loose umbels of pinkish flowers; *P. serrulata*, the fine-toothed C., is a native of China, and in W. gardens bears double flowers; *P. depressa*, the sand C., grows well in N. America, and in Britain is a handsome, but short-lived bush; *P. prostrata*, the spreading C., is a small prostrate bush which brightens the rocks of Dalmatia, Candia, and Asia Minor with its pink blossoms; *P. Japonica*, the Japan C., is a beautiful plant with double flowers which appear in Great Britain in Mar. In all the above species of true C.s the leaves come out later than the flowers, but in the bird C.s the racemes of flowers appear after or at the same time as the leaves. Of these may be mentioned *P. mahaleb*, the Mahaleb or perfumed C., a sweet-smelling shrub with a bitter and nauseous fruit; *P. padus*, the common bird C., a species which grows wild in the woods and hedges of central Europe; *P. virginiana*, the choke C., a large tree with shining deciduous leaves, used in cabinet-making in N. America; *P. capollim*, the capollim or Mexican bird C., which has a pleasant-smelling fruit, while the bark is reputed to be a valuable febrifuge. The C. laurels are allied to the bird C.s and

true C.s, and are distinguished from them by having evergreen leaves and long racemes of flowers which appear with the leaves. *P. caroliniana*, the evergreen or Carolina C. laurel, is an ornamental tree with poisonous leaves; *P. laurocerasus*, the common or broad-leaved C. laurel, is a hardy evergreen much cultivated in Brit. shrubberies and is remarkable for the amount of hydrocyanic acid secreted in its leaves; *P. lusitanica*, the Portugal laurel, a native of Portugal and the Canaries, flourishes in Britain, where it is readily propagated from its abundant fruit.



CHERRY

Cherso, see CRES.

Cherson, see KHERSON.

Chersonesus (Gk *chersonēsos*, continent-is., i.e. a peninsula), anc. name of sev. peninsulas in Europe and Asia, the most important being C. Taurica, or Scythica (Crimea), C. Cimbrica (Jutland), C. Thracica (Gallipoli), C. Aurea (Malay). By the C. Athenian writers usually meant C. Thracica. See CRIMEA; GALLIPOLI; JUTLAND; MALAYA.

Chersonesus (or Chersonese, Russian Khersones), ruins of an anc. Gk city in SW. Crimea, 2 m. W. of Sevastopol'. Founded in the 5th cent. BC, C. was the commercial and administrative centre of W. Crimea until its decline in the 14th cent. AD. Excavations have been made since 1827.

Chert, variety of quartz (q.v.) which occurs in limestone in much the same way as flints occur in chalk, though in tabular masses rather than in nodules. Its formation is due to concretion; that is silica derived from sponges passed into solution, then filtered down through the calcareous ooze and was reprecipitated when conditions were suitable for the deposition of the silica and the solution of the limestone. Thus in certain localities the calcium carbonate in the limestone has given place to silica. C. occurs in a variety of colours (grey, white, red, yellow, and brown), is coarser than flint, and is generally more

brittle. The coarser varieties are called hornstone (q.v.).

Chertsey, tn in Surrey, England, on the r. b. of the R. Thames, 20 m. WSW. of London. The riv. is crossed here by a 7-arched bridge. C. possesses the remains of a famous abbey, in which Henry VI was buried. The poet Cowley d. here and Charles James Fox lived at St Ann's Hill. Partly residential, partly industrial, and still partly agric., C. is one of the most attractive Thames-side tns in Surrey. Sev. thousand workers are engaged in engineering industries in the dist., and others in large factories in the tns just outside. Agriculture and market gardening also provide employment for considerable numbers. Pop. 31,029.

Cherubim, plural of the Heb. word cherub (*kerûb*), one of the 9 choirs of angels (see ANGEL).

Cherubini, Luigi (1760-1842), It. composer, b. Florence, the son of a musician at the Pergola Theatre. He began to study composition at the age of 9 under the Felici, and after their deaths under Bizzarri and Castrucci. In 1773 he composed a mass, and by 1778 his growing success as a writer of church music led to his being sent to study under Sarti, who not only taught him well, but gave him minor parts of his own scores to finish. From 1780 dramatic compositions occupied C. almost exclusively until his appointment in a minor post at the Paris Conservatoire in 1795. In 1785-6 he visited London, and produced *La Finta Principessa*, *L'Artaserse*, and *Giulio Sabino*. In 1788 he produced *Ifigenia in Aulide* at Turin, but from 1788 Paris was his home, and he produced there among other operas *Demophon Lodoïska*, *Elisa*, *Médée*, *Les Deux Journées*, and *Anacréon*. In 1806 he produced *Faniska* at the Imperial Theatre, Vienna. In 1815 he composed an overture and a symphony for the Philharmonic Society, London. In 1816 he was made one of the superintendents of the royal chapel, and in 1822 had become director of the Conservatoire. In 1833 he produced his last work for the theatre, *Ali Baba*. Henceforward he devoted himself to church music, and his Requiem in D minor (1836) is one of his finest works. As a composer, he is, with Gluck, an austere representative of a nobler classical style in Fr. opera; as a teacher his influence was harmful in restricting his pupils by the narrow rules of an earlier age. Beethoven greatly admired him, and was influenced by his *Deux Journées*, in his opera *Fidelio*, but C. neither understood nor appreciated Beethoven. Mendelssohn was the only young contemporary whom he openly praised.

Chéruel, Pierre Adolphe (1809-91), Fr. historian, b. Rouen. He held chairs of hist. successively at Rouen, Strasbourg, and Poitiers. His prin. books are *Dictionnaire historique des institutions, mœurs, et coutumes de la France*, 1849, and *Histoire de France pendant la minorité de Louis XIV.* 1879-80. He also ed. *Lettres du Cardinal Mazarin pendant son ministère*, 1870-91, the memoirs of Saint-Simon,

1865, and the memoirs of Mlle de Montpensier, 1891.

Cherusi, Ger. tribe occupying the basin of the Weser, N. of the Harz Forest. In AD 9 Arminius (q.v.), a chief of the C. revolted and destroyed the Rom. general Quintilius Varus and his army. Their prestige was wrested from them towards the end of the 1st cent. AD by their neighbours, the Chatti, and their ter. was later occupied by the Saxons. (Tacitus, *Annals*, 2, 11, 12, 13).

Chervil, name given to various species of Umbelliferae. Common C., *Anthriscus cerefolium*, is an ann. herb, introduced from S. Europe, and grown for its leaves, used for salads, garnishing, and seasoning. Bulbous-rooted C., *Chaerophyllum bulbosum*, a S. European biennial, is sometimes grown like carrots for its edible yellowish roots. Bur C., *Anthriscus neglecta*, and Rough C., *Chaerophyllum emulum*, are annuals native to Britain and Europe, introduced to N. America.

Cherville, Gaspard Georges Pescow, Marquis de (1821-98), was b. Chartres. He was a collaborator of Dumas père, but he wrote independently a number of books on country life and sport. He also wrote *Au village. légendes et croquis rustiques*, 1887, and *Les Chiens et les chats*, 1888.

Cherwell, Eng. riv., trib. of the Thames, rising 12 m. NE. of Banbury, and flowing E. for 30 m. through Northants and Oxon. to join the main stream near Oxford.

Chesapeake Bay, in Maryland and Virginia, and dividing the former into 2 parts, is the largest inlet on the E. coast of the U.S.A., extending 195 m., with a width of from 3 to 30 m., from the mouth of the Susquehanna R. southward to Hampton Roads. Its entrance has on its N. side Cape Charles, and on the S. Cape Henry, 13 m. apart. The land on either side of the inlet is greatly indented, and receives the R.s. Susquehanna, Severn, Patuxent, Potomac, Rappahannock, and York on the W., and James on the SW., all navigable rivs. The waters so deep that the largest ships can proceed almost to the mouth of the Susquehanna, and Baltimore is virtually washed by the ocean. The bay is connected near its head with the Delaware R. by the C. and Delaware Canal. The Dismal Swamp Canal and the C. and Albemarle Canal connect it with Albemarle Sound.

Cheselden, William (1688-1752), anatomist and surgeon, b. Somerby, Leics. He studied anatomy in London under Cowper (1686-1709), and in 1711 himself began to give lectures on the subject. He was elected a fellow of the Royal Society in 1712, and pub. a series of interesting papers, one of which recounted the sensations of a boy of 14 on recovering his sight through the formation of an artificial pupil (by C.) after being blind from infancy. In 1713 he pub. *Anatomy of the Humane Body*, long the standard book on the subject, and in 1733 *Osteographia, or the Anatomy of the Bones*, with beautiful illustrations. He was surgeon at St Thomas's, St George's, and Westminster hospitals, and his skill as an

operator has seldom been surpassed. The lateral operation for lithotomy as it is now practised was his invention. In 1737 he retired from practice owing to the jealousy of his colleagues, and d. of apoplexy at Bath, 1752. Alexander Pope (q.v.) was one of his intimate friends. Life by Sir Zachary Cope, 1953.

Chesham, urb. dist. and mkt. tn of Bucks, England, 26 m. WNW. of London, in the valley of the R. Chess (a riv. noted for its watercress and trout-fishing). C. manufs. boots and shoes, brushes and other hardwood products, scientific and surgical instruments, jewellery, chocolates, gasfired boilers, toys, and valves. Pop. (urb. dist.) 11,500.

Cheshire, co. of England, bounded on the N. by the Irish Sea and the Mersey, also by Lancs and Yorks, and on its other sides by the shires of Derby, Stafford, Salop, Flint, Denbigh, and by the estuary of the Dee. The co. contains numerous antiquities, including Rom. roads, barrows, remains of religious houses, and many old castles and manor houses. William the Conqueror made it a co. palatinate under Hugh Lupus; Henry VIII subordinated it to the crown, but the co. did not send representatives to the Eng. Parliament until 1543. Its greatest length from E. to W. is 48 m., its breadth from N. to S. is 32 m., total area (of land and water) 1015 sq. m., 76 per cent which is under cultivation. The surface of the co., except on the extreme E. border, is level, well-wooded, and in parts studded with small lakes or meres. The plain rests on red sandstone, crossed by a ridge running from N. to S. The chief rivs. are the Dee, Mersey, and Weaver, all navigable, and the co. has also a splendid system of canals—including the greater part of the Manchester Ship Canal—and an extensive railway network. The soil is chiefly clayey or sandy loam with marl or peat, and is very fertile. The land is divided into grazing and arable regions, potatoes being an important crop in the latter. Cereals grow well here, especially oats, but the chief product of the co. is its milk, only a small proportion of which is made into cheese. There are more cows to the sq. m. than in any other part of England, and the pasture land is very fine. The climate is moist and temperate. Cottons, silk, and other textiles are manuf. at the tns near the Lancs and Yorks boundaries. Shipbuilding and all forms of engineering are important, and there are large oil refineries at Ellesmere Port. Port Sunlight, with soap and margarine factories adjacent to the garden vil., is in the Wirral peninsula. One of the most remarkable products of C. is the rock-salt found in abundance in the Northwich, Winsford, Middlewich, Sandbach, and Lymm areas. To this C. owes its flourishing chemical industry, notably the Imperial Chemical Industries' works at Northwich (q.v.). There is also a factory for nuclear products at Capenhurst (q.v.). Chester is the cap., and other big tns are Birkenhead, with its world-famous docks, Wallasey, Bebington, Ellesmere Port, Macclesfield, Stockport,

Crewe, Northwich, Altrincham, and Hyde (see separate articles). C. is divided into 10 co. and 6 bor. constituencies for parl. electoral purposes, each returning 1 member. Pop. 1,258,000. See F. H. Crossley, *Cheshire* (County Books Series), 1949; J. H. Ingram, *Companion into Cheshire* (second ed.), 1949; A. Mee, *Cheshire* (new ed.), 1951.

Cheshire Regiment, The (formerly 22nd Foot), raised in 1689. Fought under Marshal Schomberg in Ireland and took part in the defence of Gibraltar in 1727, and the capture of the Is. of Louisbourg in 1758. Its grenadiers served under Wolfe at the capture of Quebec. Served many years in W. Indies, then participated in the Amer. War of Independence. Under Sir Charles Napier it gained great distinction in the Scinde war of 1843. Bears honours for S. African War, 1899–1902. During First World War it raised 38 battalions which served in France, Flanders, Gallipoli, Macedonia, Palestine, and Mesopotamia. It first received its Cheshire co. title in 1782. In the Second World War the regiment fought in NW. Europe and Italy. Its badge is the well-known acorn issuing from oak-leaves within an 8-pointed star.

Cheshunt, urb. dist. of Herts, England, on the R. Lea, 14 m. N. of London. Here is C. Great House which belonged to Cardinal Wolsey. From here Charles I set out for Nottingham (1642) at the onset of the Civil War. Temple Bar (1672) stands in Theobald's Park (q.v.). Bishop's College (a Church of England theological college) was formerly the home of a theological college founded by the Countess of Huntingdon which moved to C. in 1792. C. is the centre of the great Lea Valley horticultural industry, with the largest concentration of glasshouses in the world. Pop. (dist.) 23,880.

Chesil Bank, or **Beach** (A.-S. *ceosil*, pebble-bank), curious shingle beach on the coast of Dorset, England. It runs 18 m. SE. from Bridport, and ends in the so-called isle of Portland. At Portland end the bank is 35 ft above spring-tide level, and 200 yds broad. A peculiar fact about it is that the pebbles decrease in size from 1 to 3 in. in diameter at Portland to the size of peas at the W. end.

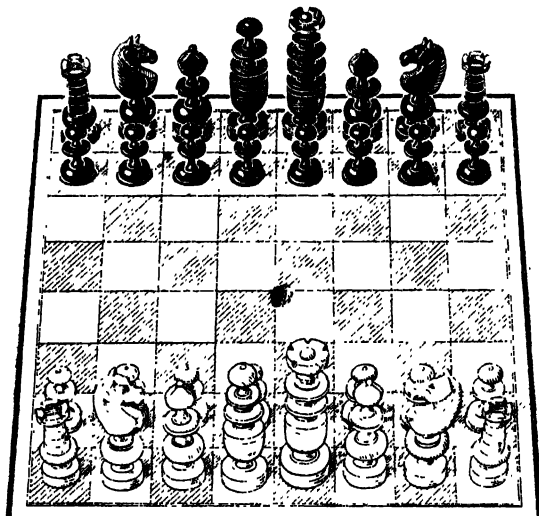
Chesné, André du (1584–1640), Fr. geographer and historiographer to Louis XIII. He was b. in the prov. of Touraine and became famous for his historical and philological learning, which won him the name of 'father of French history.' The work for which he is best known in his collection of the oldest Fr. chroniclers, *Historiae Francorum Scriptores coeclant*, ab *Gentis Origine usque ad Philippum IV tempora*, of which he ed. 4 vols., and his son pub. the fifth after his father's death.

Chesney, Charles Cornwallis (1826–76), lieutenant-colonel, prof. of military strategy at Sandhurst, and a nephew of the explorer, Francis Rawdon C. He held the position of chairman of Sandhurst in 1861, during which time he acquired fame for his 'Waterloo Lectures' delivered there.

Chesney, Francis Rawdon (1789–1872),

general and explorer, b. in co. Antrim, Ireland. It was his report, drawn up in 1829, on the subject of the isthmus of Suez that made de Lesseps project his canal scheme. The one great wish of his life was to have an overland route to India via the Euphrates, but the Fr. and Russian opposition was so great that the idea was abandoned. In connection with the scheme, however, he made 3 separate journeys to prove how far the Euphrates was navigable. He wrote the histories of his expeditions, one of which was *Narrative of the Euphrates Expedition, 1835-7*.

arranged: Queen's rook (the rook is known also as the castle), queen's knight, queen's bishop, queen, king, king's bishop, king's knight, king's rook. The front line is composed entirely of pawns. Considering the back line, it will be seen that each piece is directly opposite to an opposing piece of the same denomination; that queen faces queen and that king faces king. The white queen is on a white square and the black queen on a black square. The object of the game is to force the king of the adverse party into such a situation that he can neither move nor remain



CHESS-BOARD AND CHESS-MEN

Chesney, Sir George Tomkyns (1830-95), soldier and author, brother of Charles Cornwallis C. (q.v.). In 1848 he joined the Bengal Engineers; served in the Indian Mutiny, and in 1892 became a general, and entered Parliament as member for Oxford. He wrote sev. novels. *The Private Secretary*, 1881, being the best known. He also wrote a highly imaginative description of a supposed invasion of England, entitled *The Battle of Dorking*, 1871.

Chess, game played by two persons on a board composed of 64 squares, alternating black and white, so placed that a white square is on the right-hand extremity of the board before each player. Thirty-two chessmen are used, 16 being black and 16 white. One player takes the black men, the other takes the white, and each arranges his pieces on the board before him as shown in the illustration. Naming them from the white square on the players' right, the pieces in the back line are thus

without the danger of being taken by some other piece, for the law of the game, as will be seen later, does not allow of his being actually captured, but only threatened, and he must then remove, if possible, out of danger. If he cannot, the game is lost. From the accompanying diagram, the names of the various squares on the board may be seen. That in front of the queen's rook is known as the queen's rook's second square. Two squares in front of the queen's rook is the queen's rook's third square. Similarly Q R 4 signifies the queen's rook's fourth square, etc. The pawns are known from the piece before which they stand. Thus, in front of the queen's rook is the queen's rook's pawn, in front of the king's knight is the king's knight's pawn, and similarly for the other pieces. It is necessary to consider now the ways in which the pieces move, as the complicated nature of these moves forms one of the main difficulties for the beginner. The king has the power

of moving one square from that which he is occupying, so long as the move does not expose him to capture by any of the enemy's pieces. Neither the king nor any other piece may move to a square which is already occupied by a piece of its own colour. Thus from his own square the king could move to Q square, Q 2, K 2, K B 2, and K B square, but no further by one move. The queen may move any distance in a straight line, either laterally or diagonally, but neither queen, rook, nor bishop may pass over an intervening

or backward. Its first move may be two squares or one, i.e. it may move to its piece's third or fourth square, but after this first move it can only move forward one square at a time. Whereas it moves laterally, it can take diagonally alone. Thus, a pawn on Q 4 may take pieces on Q B 5 and K 5, but is stopped by a piece on Q 5. If a player succeeds in getting one of his pawns into a square occupied at the beginning of the game by one of his adversary's back line, he may exchange it for any piece except a king, either a queen,

♔	♔	♔	♔	♔	♔	♔	♔
Q.R.8	Q.Kt.8	Q.B.8	Q.8	K.8	K.B.8	K.Kt.8	K.R.8
♗	♗	♗	♗	♗	♗	♗	♗
Q.R.7	Q.Kt.7	Q.B.7	Q.7	K.7	K.B.7	K.Kt.7	K.R.7
♖	♖	♖	♖	♖	♖	♖	♖
Q.R.6	Q.Kt.6	Q.B.6	Q.6	K.6	K.B.6	K.Kt.6	K.R.6
♘	♘	♘	♘	♘	♘	♘	♘
Q.R.5	Q.Kt.5	Q.B.5	Q.5	K.5	K.B.5	K.Kt.5	K.R.5
♙	♙	♙	♙	♙	♙	♙	♙
Q.R.4	Q.Kt.4	Q.B.4	Q.4	K.4	K.B.4	K.Kt.4	K.R.4
♚	♚	♚	♚	♚	♚	♚	♚
Q.R.3	Q.Kt.3	Q.B.3	Q.3	K.3	K.B.3	K.Kt.3	K.R.3
♛	♛	♛	♛	♛	♛	♛	♛
Q.R.2	Q.Kt.2	Q.B.2	Q.2	K.2	K.B.2	K.Kt.2	K.R.2
♜	♜	♜	♜	♜	♜	♜	♜
Q.R.1	Q.Kt.1	Q.B.1	Q.1	K.1	K.B.1	K.Kt.1	K.R.1

NUMERICAL POSITIONS OF A CHESS-BOARD

piece. The rook also can move any distance, but his motion must always be lateral. The bishop, on the contrary, may move any distance diagonally, but may not move laterally. It will thus be noticed that the bishop always remains on squares of the same colour as his own. The white Q B can never be on a white square, and the white K B can never be on a black square. The knight's move is limited in distance and is composed of two short moves, a lateral move of one square followed by a diagonal move of one square. Thus, the Q Kt might move to Q R 3, Q B 3, or Q 2. The knight alone has the power of passing over another piece. The 'taking' of an opponent's piece is done by moving one of one's own pieces into the square occupied by one's opponent's piece and removing the latter. The pawn can only move in a forward direction (laterally) whereas all the other pieces may move either forward

rook, bishop, or knight, so that he may possibly have two queens on the board at once. A king, as has been said, cannot be taken. When another piece attacks him and he is in such a position that he might be taken at his adversary's next move, he is said to be in *check*. A player whose king is in check must do one of three things at his next move. He must move out of check, or interpose another piece so as to shield the king, or take the checking piece. When he can do none of these things he is said to be *checkmated*. 'Checkmate' is called, and the game is over. Should a player be in such a position that he can move none of his pieces without putting his king in check, but yet his king is not in check at the moment, the game is drawn, the result being given as a *stalemate*. A drawn game also results through neither player being able to checkmate the other. An important privilege allowed to the king, once in

each game, the privilege of *castling*, yet remains to be mentioned. The operation consists of a double move performed in conjunction with either the king's rook or the queen's rook, and counts as an ordinary move. In the first case K moves to K Kt square, and K R moves to K B square. In the second K moves to Q B square, while Q R moves to Q square. This move is only allowed if neither the king nor the rook has yet been moved, and it is further necessary that no piece should intervene between the two, that no square passed over should be commanded by one of the enemy's pieces, and that the king should not be in check. Note must also be made of a particular method of taking by the pawn known as taking *en passant*. It may occur when a white pawn is on a fifth square, say K B 5. If, then, the black K Kt pawn makes its initial move of two squares (i.e. to K Kt 4 or K 4), it may be taken *en passant* by the white pawn on K B 5, the white pawn moving to K Kt 3 or K 3 as the case may be. In 1955 the Fédération Internationale des Echecs (F.I.D.E.—World C. Federation) formulated a revised set of rules and the most important of these are given in the following extracts from the official trans. (pub. by Pitmans in 1956 by arrangement with the Brit. C. Federation). Provided that he first warns his opponent, the player whose turn it is to move can adjust one or more pieces on their squares. Apart from the above case, if the player whose turn it is to move touches one or more pieces, he must make his move by moving or taking the first piece touched which can be moved or taken.

The game is drawn by agreement between the two players; or, at the request of one of the players when the same position appears three times, and each time the same player has had the move. This right of claiming the draw belongs to the player (a) who is in a position to play a move leading to such repetition of the position, if he declares his intention of making this move; or (b) who is about to reply to a move by which such repeated position has been produced. If a player makes a move without having claimed a draw in the manner prescribed in (a) or (b) he then loses his right to claim a draw; this right is, however, restored to him if the same position appears again with the same player having the move. The game is also drawn when the player whose turn it is to move proves that at least 50 moves can be increased for certain positions providing that this increase in number and these positions have been clearly laid down before the commencement of the game. A *gambit* is a method often used to secure an opening for attack. By it a pawn or piece, usually a pawn, is sacrificed in order to enable a piece to secure a better position. There are various gambits, such as king's gambit, queen's gambit, etc., to each of which there is a recognised defence. The various methods of opening a game of C. may soon be learnt. White makes the first move, and so it is usual for the players to draw for colours. The commonest first move is

that of the king's pawn to K 4. The commonest second move is that of K Kt to K B 3, and these two form an excellent opening for beginners. Sometimes the stronger player gives *odds* to the weaker player to make the game more even. It may consist of the removal of any piece from the stronger player's ranks according to the odds to be given. If a pawn be given, it is almost invariably the king's bishop's pawn. It is not necessary to go into further detail as to the method of playing C., as there are many valuable handbooks to which reference may be made. On account of the interest derived from the infinite variety of its combinations, and from success depending entirely upon skill wholly independent of chance, it has become a favourite game among the educated persons of all nations, and in the course of cents. a vast literature has gathered round it.

History. The game is of the greatest antiquity, and much dispute has arisen as to the country whence it first took its rise. The game was not known to the ancients, Greeks or Romans. A distinct balance of historical tradition inclines to Hindustan. Here it has been known immemorially under the name of *chaturanga* (from *chatur*, four, and *anga*, a part or member), that is, the four *angas*, or members of an army, which are said in the *Amarakosha* to be elephants, horses, chariots, and foot soldiers. As applicable to real armies, the term *chaturanga* is often used by the epic poets of India. In a Sanskrit MS., *Bhavishtya Purana*, is given a description of a four-handed game of C. played with dice, and some historians consider this to be the most ancient form of the game. But it is not shown precisely how the four armies commanded by four kings in the above MS. became converted into two opposing armies (see on this Van der Linde, *Geschichte und Litteratur des Schachspiels*, Berlin, 1874). From India the game passed into Persia and became known there by the name of *shatranj*. The game passed from the Persians to the Arabians after they took possession of Persia in the 7th cent., and from them, directly or indirectly, it is conjectured that it came to Spain and other parts of Europe, perhaps about the 11th cent. It was known to the cultured classes throughout Europe by the time of the Crusades. The original method of play differed widely from the present one, the development of the game continuing until the 16th cent., when *castling*, the latest addition, was introduced. The first book printed in England was *The Game and Playe of the Chesse*, issued by Wm Caxton in 1475, and this fact shows the popularity of the game. The most masterly treatises on C. begin in the 16th cent. with the Portuguese Damiano, whose work is, however, distinctly inferior to the treatise by Ruy Lopez, a Sp. cleric, pub. at Alcalá in 1561. By the end of this cent., the chief home of the game had shifted to Italy, where the city of Venice had the pre-eminence. Among the C. masters of this period may be named Salvio, Greco, and Polerio. The 17th cent. is comparatively

unimportant, but the 18th cent. saw a great revival in the study of C. In the N. of Europe the name of Philidor stands alone, and in the S. the names of Ercole del Rio, Lolli, and Ponziani deserve mention. In the 19th cent. England became the supreme C. country, and Howard Staunton was generally recognised as the world's greatest player. A greater genius, however, Paul Morphy (1837-84) by name, arose in America, and defeated the strongest players of Europe. He never actually encountered Staunton, who evaded his challenges, but after Morphy had retired from the game, Staunton was defeated by Anderssen, who was in turn succeeded as champion by Steinitz. Anderssen belonged to the older school, advocating combinative methods, and Steinitz, who has had great influence on modern theory, believed in positional methods. In 1894 he was defeated by the third Ger. champion, Emanuel Lasker, who held the title for 27 years. A long projected match between him and Capablanca, the Cuban C. genius, eventually took place in 1920, and Lasker resigned after losing four games and drawing 10. Since that date C. was dominated by the personalities of Capablanca (q.v.) and the Russian, Alekhine (q.v.). In 1927 Alekhine challenged Capablanca to defend his title, and after a match of 34 games Alekhine won six, Capablanca three, and 25 were drawn. In 1934 Alekhine defeated Bogoljubov, winning eight, losing three, and drawing 15. Max Euwe became champion in 1935, beating Alekhine, 15½-14½ points, but in 1937 Alekhine beat Euwe 17½-12½ points. Alekhine d. in 1946 whilst still in possession of the title, and in 1948 a match-tournament was held amongst the best five players in the world (Botvinnik, Smyslov, Keres, Reshevsky, and Dr Euwe), out of which the Soviet champion, M. M. Botvinnik, emerged as the winner. After 1948 the world championship was organised on the basis of a three-year cycle of tournaments. In the first year zonal tournaments were held all over the world, in the second year an interzonal tournament, and in the third year a Candidates' Tournament of which the winner had the right to challenge the world champion to a match. The 1950 Candidates' Tournament at Budapest was won by Bronstein, but Botvinnik retained his title by drawing a match with him 12-12 in the following year. Smyslov won the Candidates' Tournament at Zurich in 1953, and again the world champion drew his match by 12-12 in 1954 at Moscow. International C. is governed by the F.I.D.E., which held its first tournament at Budapest in 1926. Ann. Eng. championships are held by the Brit. C. Federation, founded 1904. In this event the most successful players have been H. E. Atkins (nine times champion), F. D. Yates (six times), H. Golombek (three times), and M. Sultan Khan (three times), R. J. Broadbent, Sir George Thomas, and W. Winter all of whom won the championship twice. In 1927 the Brit. C. Federation held an international team tournament in

London under the auspices of F.I.D.E. and the champion country was Hungary. This tournament has been held on an average once every two years since 1927, the winning countries being as follows: Poland at Hamburg 1930; the U.S.A. at Prague 1931, Folkestone 1933, Warsaw 1935, and Stockholm 1937; Germany at Buenos Aires 1939; Yugoslavia at Dubrovnik 1950; the U.S.S.R. at Helsinki 1952 and Amsterdam 1954. F.I.D.E. has also organised world championship events for women, the inviolable winner before the Second World War having been Miss V. Menchik (later Mrs Stevenson) of England. After her death in the war during a bombing raid the title remained vacant until once again F.I.D.E. reorganised it and the winners since then have all been Russians. See J. R. Capablanca, *Chess Fundamentals*, 1922; A. Alekhine, *My Best Games of Chess*, 1927 and *My Best Games of Chess 1924-1937*, 1939; A. Nimzowitsch, *My System*, 1929; R. Reti, *Masters of the Chessboard*, 1933; M. Euwe, *Judgement and Planning in Chess*, 1953; H. Golombek, *The Game of Chess*, 1954; G. Stahlberg, *Chess and Chessmasters*, 1955.

Chest, or **Thorax**, anatomical term for the uppermost section of the trunk, or that part of the body which is above the abdomen and below the neck. It contains the heart and lungs, the great arteries and veins, the windpipe and its branches, the gullet and the thoracic duct, and is conical in shape, with rounded sides which are flattened at front and back. (For the organs of the chest, see the diagram accompanying article on ABDOMEN.) The upper end is small, slopes downwards and forwards, and contains the gullet and windpipe, and those arteries and veins leading from and to the heart through the neck, together with certain nerves. The lower end is larger, slopes downwards and backwards, and is enclosed by the diaphragm, which is convex when viewed from above, and which separates the C. from the abdomen. Muscles radiate from this diaphragm to the body wall, and in respiration, by the contraction of these muscles and the consequent flattening of the diaphragm, together with the action of the layer of muscles covering the C., which draw the ribs upwards and outwards, the cavity of the C. is enlarged. The C. is constructed of 12 pairs of ribs starting from the vertebral or spinal column, together with the breastbone, the diaphragm, and the intercostal muscles. Since the C. contains the heart and lungs, two of the 3 vital organs of the body, the other being the brain, it is the seat of a large number of the diseases of the human system. See HEART; LUNGS; MAN; SKELETON; ANATOMY; PHYSIOLOGY, etc.

Chest, large box made of wood or iron with a hinged lid, used as a receptacle for treasure, records, or linen, etc. It is of very ancient origin, being one of the oldest pieces of household furniture. In the old days C.s were sometimes covered with leather and often very much ornamented.

They were frequently transferred from place to place as personal luggage. C.s are now often found in churches for the reception of vestments, plate, and par. records, etc., being equivalent to modern safes or strong-boxes. Coffin (O.F. *cofre*; Low Lat. *cofrum*) is a C. or box for money or valuables, and the word was used as a synonym for treasury (cf. 'Comes to the privy coffer of the State,' *Merchant of Venice*). See FURNITURE.

Chester, Earl of, see BLUNDEVILLE.

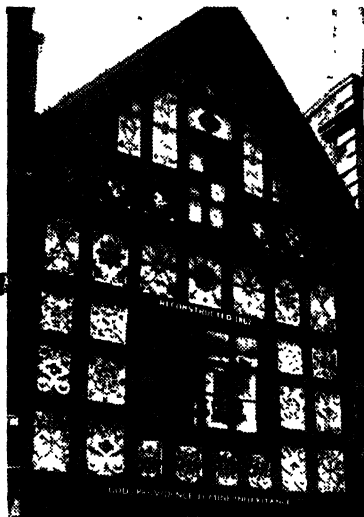
Chester, episcopal city, parl. and co. bor. and the administrative and geographical cap. of the co. of Cheshire, England, on the banks of the Dee, 16 m. SE. of Liverpool. It is an important shopping and residential centre to which has been added the development of progressive specialised light industries such as the manuf. of electrical switch-gear and metal window frames, aided by the fact that it is an important road and rail centre.

It is almost 2000 years ago since the 20th Rom. Legion chose as the site for its fortress a low sandstone hill at the head of the estuary of the R. Dee and called it after the riv.—*Dēva*; this was the beginning of C. In late Saxon times, it was a place of consequence with its own mint and royal palace, and not until 8 years after the battle of Hastings did it submit to Norman rule. The early Middle Ages were perhaps the time of C.'s greatest glory; its port had by then become the centre for the trade with Ireland, and the city itself was the base for many a warlike royal expedition into Wales. In 1237, on the death of the last of the Norman earls, the earldom was taken into the hands of the Crown and has since always been one of the titles of the eldest son of the king—Prince of Wales and Earl of Chester. King Richard II held the city in especial esteem, elevating the earldom to the dignity of a principality. By the 15th cent. the silting up of the R. Dee had begun to interfere with traffic to the harbour and in time it gradually strangled the seaborne trade of C. The city has possessed sheriffs since the time of the Norman earls, and mayors since 1238. Its constitution was confirmed by the great charter of Henry VII in 1506, the city being constituted a co. of itself. The mayor is by virtue of his office admiral of the Dee (a relic of C.'s former maritime greatness).

C.'s most distinctive architectural feature is its rows. These consist of a double tier of shops, one at ground level and the other at first-floor level, each provided with a footway, the upper one being set back and covered by the second storeys of the buildings. The first historical reference to the rows occurs in the early 14th cent. C. is the only city in England which still possesses its walls perfect in their entire circuit of 2 m. Built originally by the Romans in the 1st cent. AD, and later extended, they still contain substantial portions of Rom. work. The old gateways have been rebuilt but some of the towers still

remain. There are many picturesque timber-framed houses, notably Bishop Lloyd's House (early 17th cent.), God's Providence House (built 1652 and reconstructed 1862), Leche House (16th cent.), Stanley Palace (1591) in Watergate Street, the 'Bear and Billet' (17th cent.), Tudor House (17th cent.), and the Falcon Café (1626) in Lower Bridge Street.

The cathedral, which up to the time of Henry VIII was a Benedictine abbey, dates from 1053. Built in a combination of every style from Norman to Late Perpendicular, it was restored in 1876. In a comparatively modern set of corbels



GOD'S PROVIDENCE HOUSE, CHESTER

on the walls of its S. transept are included the old story of Alexander and the griffins, besides caricatures of Disraeli, represented as the Brit. lion defending the Crown against Dr Kenelly, and Gladstone with daggers and lion's body, in the act of overthrowing the Irish Church. Also noteworthy are the churches of St John the Baptist (traditionally said to have been founded by King Ethelred in AD 689 and perhaps more probably by Earl Ethelred in 901); St Mary-on-the-Hill (belonging mainly to the 15th and 16th cents.); and St Peter (a church has occupied this site since AD 907). The chief modern buildings are the tn hall (1869); Grosvenor Museum and School of Art, built at the suggestion of Charles Kingsley, who was then canon of C.; and the King's School, founded by Henry VIII (1541) and reorganised as a public school in 1873. Roodee Common (69 ac.) is the scene of the ann. race meeting in May. The city returns 1 member to Parliament. Pop. 48,229.

Chester, port city in Delaware co., Pennsylvania, U.S.A., 15 m. from Philadelphia. The Pennsylvania Military College and the Crozier Theological Seminary are both estab. here. It has large shipyards, boiler and engine works, factories and foundries, etc. Pop. 66,039.

Chester-le-Street, mrkt tn in the co. of Durham, 6 m. N. of Durham city. Its par. church of St Mary and St Cuthbert was formerly collegiate, and the vil., situated on the auct Ermine Street, was the seat of the Bishop of Bernicia from 883 to 995, under the name of Cunceastre. In its neighbourhood are Lambton, Lumley, and Ravensworth Castles. Collieries surround C., though the tn is semi-residential in character. Pop. 18,700.

Chester Plays, see MIRACLE PLAY; MORALITY.

Chesterfield, Earl of, title formerly borne by the family of Stanhope, later Scudamore-Stanhope, created 1628. In 1883 the direct line failed, and Henry E. Scudamore-Stanhope became the 9th earl. The title devolved on the 7th Earl Stanhope on the death, in 1952, of the 12th Earl of C., but it has not been claimed by him.

Chesterfield, Philip Dormer Stanhope, 4th Earl of (1694–1773), statesman, courtier, and letter-writer, eldest son of the 3rd earl, and educ. at Trinity Hall, Cambridge. He succeeded to the earldom in 1726, and 2 years later went as ambas. to The Hague, where he remained until 1732. He had formed an intimacy with Mlle du Bouchet, by whom he had a son, but the connection did not endure, and in 1733 he married the daughter of the Duchess of Kendal, an act which seriously offended George II. Soon after he became the recognised leader of the opposition in the House of Lords, and subsequently held important ministerial and diplomatic appointments. Nowadays, however, he is remembered principally for his literary connections. He was a friend and correspondent of Voltaire, and at one time offered to befriend Johnson, who in 1747 addressed to him the 'plan' of his dictionary. C. thought no more of Johnson until the pub. of that work was announced 7 years later, when he wrote in the *World about it, a belated attention which the lexicographer resented. 'The notice which you have been pleased to take of my labours, had it been early, had been kind; but it has been delayed until I am indifferent and cannot enjoy it; till I am solitary, and cannot impart it; till I am known, and do not want it.' This letter has been universally acknowledged as a masterpiece of indignant rebuke. C.'s fame also rests on the letters to his natural son, in which he, the most elegant of mankind, endeavoured to teach his son the art of being agreeable in society. These letters were pub. by his son's widow, Eugenia Stanhope, in 1774, and were included in Lord Mahon's *Letters of Philip Dormer Stanhope, Earl of Chesterfield*, 1845–53. See W. Ernst, *Memoirs of the Life of Philip Dormer, fourth Earl of Chesterfield*, 1893; R. Coxon, *Chesterfield and His Critics*, 1925.*

Chesterfield, mrkt tn and municipal bor. in Derbyshire, England, 24 m. NNE. of Derby on the R. Rother. The tn is famous for the crooked spire of the 14th-cent. par. church. George Stephenson, the 'father of railways,' is buried in Trinity Church. Industries include engineering, and the manuf. of earthenware products, surgical dressings, and cardboard boxes. To the SE. are extensive coal-fields. Pop. 68,540.

Chesters, residence near Chollerford, Northumberland, England. It is in the midst of a park containing a section of the Rom. wall and remains of the Rom. station of Cilurnum. Much excavation work has been carried out and a fine collection of Rom. remains is housed in the museum in the park.

Chesterton, Cecil Edward (1879–1918), journalist and author, b. London, brother of G. K. C. (q.v.). He was educ. at St Paul's School. His first book, *Gladstonian Ghosts*, 1905, was directed against traditional liberalism. In 1910 appeared *Party and the People*, and *Nell Gwynne* in 1911; and in the latter year, in collaboration with Hilaire Belloc (q.v.) he wrote *The Party System*. He was on the executive of the Fabian Society, 1905–7, first secretary of the Anti-Puritan League, 1907, sub-editor of the *Eye Witness* (afterwards *New Witness*), 1911–12, then editor. He became a Rom. Catholic in 1912. His persistent criticism of the circumstances connected with a contract between the gov. and the Marconi Wireless Telegraph Co. led to the House of Commons appointing a committee of inquiry, and he was fined for criminal libel. In the war period, before he joined the colours, he pub. *The Prussian hath said in his Heart—*, 1914, and *The Perils of Peace*, 1916; his *History of the United States* was pub. in 1918. He d. in a military hospital in Boulogne.

Chesterton, Gilbert Keith (1874–1936), journalist and author, b. Campden Hill, Kensington. He was educ. at St Paul's School until 1891, and then entered the Slade School to study art. He soon began literary work, however, at first reviewing art books for the *Bookman* and the *Speaker*, and working in a publisher's office. He definitely took up literature as a career in 1900, and contributed largely to a great variety of periodicals. It was his *Browning* in the Eng. Men of Letters series that first gave him a place among the critics. With *The Napoleon of Notting Hill*, 1904, he began the fantastic romances which, together with the 'Father Brown' detective stories, captured the larger public. A Saturday column in the *Daily News* stung the party Liberals through a decade. For 30 years he wrote the Notebook page of the *Illustrated London News*—an astonishing feat for the most anarchic of journalists. Prose and verse flowed unceasingly from his pen. In 1901 he married Frances Blogg. He is popularly regarded as merely a fountain of brilliant paradox, but that is a very superficial reading of him. Largely influenced by his friend Hilaire Belloc, he gradually discarded, or

became aware of his innate mistrust of, all ideas of evolutionary development—which appeared to him to involve a mechanistic conception of mankind. It was noteworthy that almost every critic of C. claimed him as great in his own field, whether fiction, belles-lettres, poetry, literary criticism, or philosophy. C.'s reception into the Church of Rome was announced in Aug. 1922.

C. applied the same principle in his positive politics. Regarding the conscious will as the cause of all action, he saw no reason why a past state of affairs should not be resuscitated anywhere if desirable. So he was president of the Distributist League, of which *G.K.'s Weekly* was (more or less) the organ. Distributism is a term invented by Belloc (q.v.) to denote a revolt against Capitalism in the direction opposite to Socialism. It was C.'s view that it would strengthen the 'small man,' discourage 'big business,' and endeavour to re-localise the pop.

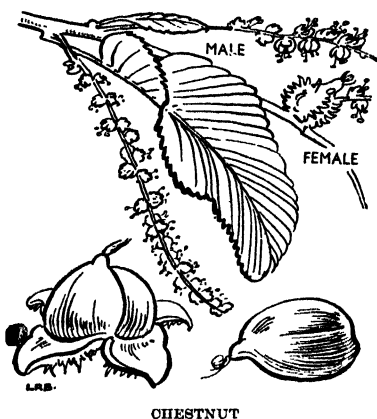
Among his books are *The Wild Knight and other Poems*, 1900, *The Defendant*, 1902, *Twelve Types*, 1902, *G. F. Watts*, 1904, *The Napoleon of Notting Hill*, 1904, *The Club of Queer Trades*, 1905, *Dickens*, 1906, *Orthodoxy*, 1908, *The Man who was Thursday*, 1908, *George Bernard Shaw*, 1909, *The Innocence of Father Brown*, 1911, *The Ballad of the White Horse*, 1911, *Manalive*, 1912, *The Victorian Age in English Literature*, 1913, *The Flying Inn*, 1914, *The Wisdom of Father Brown*, 1914, *Poems*, 1915, *A Short History of England*, 1917, *Irish Impressions*, 1918, *The Uses of Diversity*, 1921, *Eugenics and other Evils*, 1922, *The Man who knew too Much*, 1922, *What I saw in America*, 1922, *St Francis of Assisi*, 1923, *William Cobbett*, 1925, *The Everlasting Man*, 1925, *The Incredulity of Father Brown*, 1926, *The Queen of Seven Swords*, 1926, *The Secret of Father Brown*, 1927, *The Return of Don Quixote*, 1927, *Generally Speaking*, 1928, *Catholic Essays*, 1929, *Chaucer*, 1932, *The Scandal of Father Brown*, 1935, *Autobiography*, 1936, *The Paradoxes of Mr Pond*, 1937.

See E. Cammaerts, *The Laughing Prophet*, 1937; H. Belloc, *On the Place of Gilbert Chesterton in English Letters*, 1940; Maisie Ward, *G. K. Chesterton*, 1944, *Return to Chesterton*, 1952; H. Kenner, *Paradox in Chesterton*, 1948.

Chesterton, see NEWCASTLE-UNDER-LYME.

Chestnut, or *Castanea*, genus of Fagaceae known to the N. hemisphere and cultivated for the handsome appearance of the species and the economic value of the fruit. *C. sativa*, the Sp. or European C., helps to form dense forests, and the fruit consists of 2 or 3 nuts enclosed in a prickly burr. The fruit, called the sweet C., forms a common article of diet in Europe in its raw state, when roasted, or when ground into flour. As confectionery they are candied, and receive the name of *marrons glacés*; the starchy matter contained in them makes them of great value as a food. The horse C., or *Asculus hippocastanum*, differs in most important botanical points from the sweet C.; it is a species of

Hippocastanaceae which is cultivated for its stately appearance, and the fruit is a leathery capsule resembling the sweet C. only in being prickly. The specific name was given to the plant on account of the marks of the leaf-scar which seem like a miniature horse-shoe. The Australian C., or *Castanospermum australe*, is a leguminous plant which is the only species in the genus; its outward appearance is unlike *Castanea*, but the roasted seeds taste like those of the sweet C.



Chetham, Humphrey (1580–1653), b. Crumpsall Hall, Manchester. He was in turn a merchant, a private banker, and a cloth manufacturer in Manchester. He amassed a considerable amount of money, £7000 of which he left for the foundation of a hospital for 40 poor boys. This was opened in 1656, and the number of boys now cared for has greatly increased. With a further £1000 and the residue of his property he founded a library, now containing over 70,000 vols. See T. Fuller's *Worthies*, 1840, ii. 214.

Chettie, Henry (c. 1560–c. 1607), dramatist and pamphleteer, son of Robert C., a dyer of London. In 1577 he bound himself apprentice to a stationer. In 1592 he pub. *Greene's Groat's-worth of Wit*. He found it necessary to repudiate any share in the pamphlet in his *Kind Hurl's Dream*, 1593, and to apologise to 3 persons who were abused in it, of whom Shakespeare appears to be one. In 1595 he pub. *Piers Plainnes Seaven Yeres Prentishship*, and between then and 1603 he wrote, or collaborated in, over 40 plays. Meres speaks of C. in his *Palladis Tamia* as 'one of the best for Comedy.' His money difficulties were constant, and are sometimes referred to by Henslowe in his *Diary*. Of C.'s own plays only *The Tragedy of Hoffman* was printed, 1631. For *Troynes Revenge* and the tragedy of *Polefeme* Henslowe paid him 'fittyte shellenges.' In *The Pleasant Comodie of Patient Grissill*, 1603, he collaborated

with Dekker and Haughton, and in *The Death of Robert, Earle of Huntingdon*, 1601, with Munday. In 1603 he pub. *England's mourning garment*, an elegy upon Queen Elizabeth, in which he alludes to contemporary poets. See H. Jenkins, *The Life and Work of Henry Chettle*, 1934.

Chetwode, Sir Philip Walhouse, 1st Baron (1869-1950), Brit. soldier. Educ. at Eton. Entered 19th Hussars (from militia) in 1889. Colonel 1911, major-general 1916, lieutenant-general 1919, general 1926. Fought in the Burma campaign 1892-3, and in the S. African War 1899-1902. In the First World War he commanded the 5th Cavalry Brigade in 1914-15, the 2nd Cavalry Div. in 1915-16, the desert column and canal defences, Egypt, 1916-17, and finally the 20th Army Corps 1917-18, which captured Jerusalem. Mentioned in dispatches 11 times. After the First World War he was military secretary at the War Office 1919-20, deputy chief of the Imperial General Staff 1920-2, adjutant-general to the forces 1922-3, general officer commanding-in-chief Aldershot Command 1923-7, chief of the General Staff, India, 1928, commander-in-chief in India 1930-1935, field marshal 1933, constable of the royal palace and the fortress of London 1933.

Chetwood, Knightly (1650-1720), div. and writer, b. Coventry. He became dean of Gloucester about 1707. He contributed a life of Lycurgus to the trans. of Plutarch's *Lives* pub. in 1683, and wrote the life of Virgil and the preface to the *Pastorals* in Dryden's trans. of Virgil, 1697, and sev. biographies, essays, trans., sermons, and poems.

Cheval de Frise, or **Chevaux de Frise** (Fr. *cheval*, a horse; *de Frise*, of Friesland), in fortification, an obstacle consisting of pieces of timber traversed with iron spikes, 5 or 6 ft long and pointing outwards, used to close a breach or defend a narrow passage against the advance of cavalry. It was first used in the Dutch War of Independence at the siege of Groningen in Friesland.

Chevalier, Albert (1861-1923), coster comedian and music-hall artist, b. London, the son of a Fr. master at Kensington Grammar School. In 1877 he acted in *An Unequal Match* at the Prince of Wales's Theatre, taking the name of Knight, and later he was associated with John Hare. In 1891 he introduced his famous coster comedian sketches and songs at the Pavilion Music Hall. He wrote many plays, sketches, and monologues; and one of the former, *Tommy Dodd*, was produced in 1898 at the Globe Theatre. In his later years he frequently gave entertainments consisting of items from his former 'turns.' His last public appearance was in Nov. 1922, in *My Old Dutch*, by himself and Arthur Shirley.

Chevalier, Maurice (1889-), Fr. actor, vocalist, revue artist, and film star, b. Mémilmontant, near Paris. Married Yvonne Vallée; marriage dissolved. He started life as an electrician; then engraver, and made his first appearance on

the stage as a singer at the Palais du Travail, Belleville, 1906. From 1909 to 1913 he was at the Folies Bergères, where he became dancing partner to Mistinguette. He fought with the Fr. Army in the First World War and was a prisoner of war for over 2 years. He made his first London appearance at the Palace Theatre in the revue *Hullo, America*, succeeding Owen Narcs therein in 1919. He began his film career in 1929 and became one of the outstanding stars of the cinema. Later he became interested in theatre management. He was in Paris when the Germans occupied it in the Second World War and had to remain there during the Occupation. He is one of the very few people who can hold the rapt attention of an audience single-handed for over 2 hrs.

Chevalier, Michel (1806-79), eminent Fr. economist and statesman, b. Limoges. In his early days he trained as an engineer, but in 1829 he joined the Socialist school of Saint-Simon. He became the editor of the *Globe*, the organ of the Saint-Simonians, and in 1832 he was arrested, and sentenced to a year's imprisonment on account of certain articles which had been pub. He was released after 6 months, and sent by Thiers to America to inquire into the railway and water systems there. Later he went on an economic expedition to England, which resulted in the pub. of his *Des intérêts matériels de la France*, 1838. In 1840 he was made prof. of political economy at the Collège de France. In 1851 he pub. an important book advocating free trade; and he, with Richard Cobden, played an important part in securing the commercial treaty between France and England, 1860. The same year he was created member of the Senate, and for many years took an active part in discussions, until he retired from public life in 1870.

Chevalier, formerly a horseman, or a knight; it is also an honorary title used by the younger sons of a Fr. noble family. The name is still in use among members of certain foreign orders, such as Chevalier of the Legion of Honour. Prince Charles Edward was known as the 'Young Chevalier.'

Chevalier de St George, see STUART, JAMES FRANCIS EDWARD.

Chevet, in architecture, the apsidal E. end of a large Fr. church, having an aisle or ambulatory round the apse, surrounded by a ring of chapels. Westminster Abbey provides a rare Eng. example.

Cheviot Hills, range of hills stretching from N.E. to S.W. between England and Scotland, and covering about 35 m. of the border between the 2 countries. The larger part of the range is in England, the smaller portion being in Roxburghshire. The highest peak is The Cheviot, 2676 ft. Other peaks forming the range are Cairn Hill, 2545 ft. Hedgehope Hill, 2348 ft. Windy Gyle, 2039 ft. Peel Fell, 1975 ft. and Carter Fell, 1815 ft. The range is well covered with grass, and affords excellent pasturage for the flocks which graze on its sides. The S.W. portion of the range consists chiefly of limestone belonging to the carboniferous

system, but the highest peaks are of volcanic origin, pointing to the Lower Old Red Sandstone Age. A huge mass of granite pierces these volcanic-formed rocks for about 20 sq. m., forming The Cheviot.

Chevreul, Michel Eugène (1786-1889), Fr. chemist, b. Angers, where his father was a physician. At the age of 17 he went to Paris, and entered L. N. Vauquelin's college, where he studied with much zeal and success, becoming in time Vauquelin's assistant at the natural hist. museum in the Jardin des Plantes. In 1813 he was made prof. of chem. at the Lycée Charlemagne, and took charge of the Gobelins tapestry works, where he performed his researches on colour contrasts. In 1826 he became a member of the Academy of Sciences, and was elected foreign member of the Royal Society of London. In 1830 he became director of the natural hist. museum in Paris. In 1886 his hundredth birthday was celebrated with great public rejoicings, and a grand fête given at the museum in his honour. His name is famous for his discoveries of margarine, stearin, and olein, as well as for research work on dyes and soap-making.

Chevron (Fr. *chèvre*, a goat): 1. In architecture a decoration introduced into England in the 11th cent., and consisting of a moulding with a zigzag outline, examples of which are to be found in Canterbury and Durham Cathedrals. It is a common decoration in the Zimbabwe ruins, Rhodesia, and in S. Arabia. It is used also in the cloisters of Monreale, near Palermo, in those of St Paul, outside Rome, and in many Ger. churches. A very early example is the tomb of Agamemnon, at Mycenae.

2. In heraldry C. is one of the ordinaries formed of 2 bands, joined together at the top, and coming down to the ends of the shield in the form of a pair of compasses. Shields may have 1, 2, or 3 C.s, and in some as many as 5 have been found. It is probably the earliest among the Eng. armorial charges. As badge of rank see STRIPES AND CHEVRONS.

Chevrotain, or Mouse-deer, of the mammalian ungulate family Tragulidae. The family includes 2 genera, *Tragulius* and *Hyemoschus*. The first contains many species of small animals, which have more or less the characteristics and habits of some rodents. They inhabit Asia, the Malay Archipelago, Ceylon, and India. To the second belongs only 2 species, known as the water C., which comes from Africa.

Chewing-gum, preparation made from a gum called chicle, which is the product of a tree, *Achras sapota*, native of W. Indies and Central America. It is sweetened, and various flavouring substances are added to it. It has become, in the U.S.A., a favourite sweetmeat, which is chewed but not swallowed.

Cheyenne: 1. Cap. of the state of Wyoming, U.S.A., situated near the Laramie Mts. It is a transportation, trade, and distribution centre, and a shipping point for sheep and cattle.

There are railroad shops, a municipal airport, and an oil refinery. Manufs. include dairy and bakery products and beverages; lumber is also produced. Here are the state capitol, the Federal building, and the governor's mansion. Pop. 31,935.

2. A riv. in U.S.A., composed of 2 branches, which take their rise in Wyoming, and flow NW. through S. Dakota to join the Missouri, 35 m. NW. of Pierre. Length of each branch about 350 m.

Cheyenne, N. Amer. Indians of the Algonquian linguistic family and one of the most famous and warlike of the Plains tribes. They originated in Minnesota, but now inhabit reservations in Montana, Oklahoma, and S. Dakota. They number about 4400. See K. Llewellyn and E. A. Hoebel, *The Cheyenne Way*, 1941.

Cheylesmore, Herbert François Eaton, 3rd Baron (1848-1925), soldier. Entered Grenadier Guards, 1867, and reached the rank of major-general. On retirement from the army in 1899, he devoted himself to municipal work, being mayor of Westminster, 1905-8, and chairman of the London Co. Council, 1912-13. A skilled marksman, C. was the leading spirit in the foundation of the Bisley ann. meeting. During the First World War he presided over sev. courts martial, including those which condemned to death Karl Lody, the Ger. spy, and the leaders of the 1916 Dublin rising.

Cheyne, Thomas Kelly (1841-1915), theologian and O.T. scholar, b. London. He was educ. at Merchant Taylors' School, and afterwards went to Worcester College, Oxford. Later he went to Göttingen, and studied the Ger. theological methods. At Oxford he won the chancellor's medal for the Eng. essay, and in 1868 became fellow of Balliol College. He was appointed rector of Tendring in Essex in 1880, where he remained until 1885, when he was made prof. of the interpretation of Holy Scripture at Oriel College, Oxford, which post also held a canonry at Rochester. In 1889 he delivered the Bampton lectures at Oxford. He was a member of the O.T. revision company, and joint editor of the *Encyclopaedia Biblica*, 1899-1903. He was also in earlier years editor of the O.T. portion of the Variorum Bible, and organised the theological part of the original *Academy*. In later years his biblical criticism became very extreme. In 1908 he resigned his post as prof. He was author of many books and lectures, the most important of which are *The Prophecies of Isaiah*, 1880-1881, *Exposition of Jeremiah and Lamentations*, 1883, *Book of Psalms*, 1884, 1888, *Job and Solomon*, 1887, *Jeremiah, his Life and Times*, 1888, *The Hallowing of Criticism*, 1888, *Aids to the Devout Study of Criticism*, 1892, *Introduction to Isaiah*, 1895, *Isaiah*, 1897-9, *Jewish Religious Life in Post-Exilic Times*, 1898, and *Critica Biblica*, 1903.

Cheyne, Sir William Watson (1852-1932), Scottish surgeon, b. at sea off Hobart, Tasmania. He graduated in medicine at Edinburgh Univ., 1875, and became house surgeon to Lister, first in

Edinburgh and later at King's College Hospital, London. He was assistant surgeon and later surgeon to that hospital (1880-1917) and prof. of surgery there (1891-1917). He became a fellow of the Royal College of Surgeons in 1879, was Hunterian prof. 1888-90, was president from 1914 to 1916, and was awarded its Lister Memorial Medal in 1924. He was elected F.R.S. in 1894 and was created a baronet in 1908 on becoming surgeon-in-ordinary to King Edward VII. He was M.P. for the Univ. of Edinburgh and St Andrews, 1917, and for the Scottish univs., 1918-22. C. was a staunch advocate of the antiseptic principles introduced by Lister. His prin. works are *Antiseptic Surgery*, 1882, *Suppuration and Septic Diseases*, 1889, *Treatment of Wounds, Ulcers, and Abscesses*, 1894, *Tuberculous Disease of Bones and Joints*, 1895, *Manual of Surgical Treatment* (with F. Burghard, 7 vols.), 1899-1903, and *Lister and his Achievement*, 1925. See *Dictionary of National Biography*, 1931-40.

Cheyne-Stokes Respiration, breaking up of the ordinary rhythm of breathing into periods of waxing and waning. The breathing increases in depth until it reaches a maximum, becomes shallower again until it ceases altogether, then recommences and gains in depth once more, the cycle being repeated again and again. Respiration is controlled by the respiratory centre in the medulla, and a rise in the carbon dioxide content of the blood stimulates the centre (see RESPIRATION). C.-S. R. is a grave sign, indicating that the normal functioning of the respiratory centre is disorganised.

Cheyney, Peter (1896-1951), full name **Reginald Evelyn Peter Southhouse-Cheyney**, crime novelist, b. London. Educ. at the Mercers School and London Univ., he worked for a time as a law clerk, then became an actor, and after that a journalist. His earliest pubs. were 2 books of verse. His first successful crime novel was *This Man is Dangerous*, 1936; others are *Dames Don't Care*, 1937, *Don't Get Me Wrong*, 1938, *You Can't Keep the Change*, 1940, *It Couldn't Matter Less*, 1941, *Sorry You've Been Troubled*, 1942, *You Can Always Duck*, 1943, and *Dance Without Music*, 1947.

Chiabrera, Gabriello (1552-1637), It. poet, b. Savona, and founder of the Pindaric school of poetry. He wrote many odes, lyrics, and *canzonetti*, which are full of mythologic allusions and affectations, the error of the times in which he lived. His best poetry is to be found in the *canzonetti* and *scherzi* written for music. Some of his *canzonetti*, like the anacronautics of Ronsard, are most elegant and graceful. Sev. of his epitaphs have been trans. by Wordsworth. There were eds. of his lyric work pub. in Rome 1718, Venice, 1731, Leghorn, 1781, and Milan, 1807. All the rest of his work has long sunk into oblivion.

Chiachou, see TSINGTAO.

Chian, or **Klan**, tn in Kiangsi prov., China, situated on a trib. of the Kan R.

Chiana (anc. *Clanis*), riv. of Italy, originally a trib. of the Tiber (q.v.), in the

prov. of Arezzo (q.v.). Its valley is very fertile, but was once extremely unhealthy owing to the overflow of the riv. The riv. bed was deepened in the 18th cent., and the water led by channels to the Arno (q.v.) as well as the Tiber. Length 35 m.

Chiang Kai-shek (1887-), Chinese general and politician, b. Fenghua, Chekiang, and trained in the Paoting Cadet School. Whilst a student in a Jap. military school he joined Dr Sun's revolutionary party, but it was not until he was 34 that he gained prominence on his appointment as principal of the Whampoa Military Academy when he returned from Soviet Russia. At this period the Kuomintang (hereafter abbreviated KMT) was in alliance with the Chinese Communist party and the Russian adviser Borodin had considerable influence over C. K. When Dr Sun d. in 1925, C. K. was appointed commander-in-chief of the KMT forces in Canton, with the Russian general, Galen, as his chief of staff. In 1926, with the assistance of the Chinese Communists, C. K. successfully led the N. expedition to the Yangtze, and the KMT gov., which had been set up the year before in Canton, was moved to Wuhan. He soon quarrelled, first with the Russians who were subsequently expelled from China, and then with his own generals and with the Communists with whom he was soon to engage in incessant civil wars.

His grand purge, started on 15 May 1927, resulted in the liquidation of large numbers of students, workers, peasants, and his personal rivals. His slogan was 'No parties outside the KMT, no factions inside the KMT!' While the smaller parties, such as the Social Democratic party and the China Youth party, were driven underground, the Communists now took up arms openly against him. His move was so unpopular that in Aug. he was forced to resign by his own colleagues. In Dec. 1927, while leaving his first wife, Mao Shih, in his native tn. Fenghua, and sending his second wife, Ch'en Chieh-ju, to America, he married as his third wife Soong Mei-ling, sister of Mme H. H. K'ung and T. V. Soong. Thus a triumvirate was formed with the 2 new brothers-in-law, who were later to become his prime minister, foreign minister, and finance minister by turns. Shortly before the wedding C. K. was baptised in a Methodist church in Shanghai. In Oct. 1928 he resumed the presidency; this was followed by his war with Gen. Li Tsung-jen in the next spring; and in 1930 he was again engrossed in a fierce civil war with the Governor of Shansi, Yen Hsi-shan, and the Christian general, Feng Yu-hsiang, who, together with Wang Ching-wei, formed a separate gov. in Peking. This war spread to 7 provs., from N. Kiangsu to Shensi, and was only ended by the intervention on C. K.'s side of the troops of Chang Hsueh-liang from Manchuria. The vacuum thus left in Manchuria was to be filled by Jap. invaders in the following autumn (1931). Meanwhile his quarrel with the Kwangtung faction inside the KMT went on,

and it eventually culminated in the arrest by C. K. of both Hu Han-min, the president of the Legislative Yuan (Parliament), and of Gen. Li Chi-shen, Governor of Kwangtung. From 1930 to 1934 he launched 5 fundamentally unsuccessful 'Extermination of Bandits' (i.e. Communists) campaigns, and even after the Jap. invasions had begun he transferred Chang Hsieh-liang's Manchurian troops to Shensi and urged Chang to fight the Communists in Yenan. Resentful at his losses to the Japanese, first of Manchuria and then of Hopen, Chang defied C. K.'s order, mutinied, and kidnapped him in Sian on 12 Dec. 1936, but C. K. was subsequently released through the mediation of Chou En-lai (q.v.), and an agreement was reached for a united front between the Communists and the KMT against the invading Japanese. Though from 1931 to 1943 Lin Shen was the president of China, C. K. in his capacity as the chairman of the Military Council was dictator of the country, justifying his rule on the grounds that China was not a constitutional rep. but was under the tutelage gov. of the KMT, of which he was the leader; and on the death of Lin Shen in 1943 he again assumed the presidency. After the war he once more parted company with the Communists and resumed the 'Extermination of Bandits' campaign in 1947; but the corruption of his gov. had by this time lost him support both in China and in W. Europe, and after a series of defeats his troops were completely routed by Mao Tse-tung's Communist Army on the mainland in 1950. C. K. fled to Formosa with half a million soldiers in 1949 and became the president of the refugee regime on the is. His gov. is still recognised by the U.S.A. as the rightful gov. of China. See CHINA, History and CHOU EN-LAI; also R. Payne, *Chiang Kai-shek: the Generalissimo*, 1948, and C. P. Fitzgerald, *Revolution in China*, 1951.

Chiangyin, or **Kiangyin**, tn in the prov. of Kiangsu, China. It stands in a strongly fortified position commanding a narrow part of the Yangtsekiang, 80 m. distant from Shanghai.

Chianti, lt. mt. range in Tuscany (q.v.), part of the Apennines (q.v.). Its slopes are covered with vineyards, and olive and mulberry plantations, and it gives its name to a famous (principally red) wine. The chief tn of the wine-producing dist. is Poggibonsi (q.v.).

Chiao-chow, or **Kiaochow**, see TSINGTAO. **Chiapas**, Pacific state of Mexico, bounded on the W. by Veracruz and Oaxaca, and on the E. by Guatemala. Area 28,732 sq. m. It is mountainous, especially in the N. and SE., one of the highest peaks being Tacaná, 13,333 ft, an active volcano, and another the Soconusco, 7806 ft. The extensive Maya ruins in the NE. were among the first such discovered by European scientists (1780), while the beautiful murals of Bonampak are among the most recent. On the E. side stretches an undulating plateau, well wooded, with a plentiful water supply. Agriculture and fruit farming

flourish, and stock-raising is an important industry. Cap. is Tuxtla Gutiérrez. Pop. 903,200.

Chiaromonte Gulfi, tn in Sicily (q.v.), 7 m. N. of Ragusa (q.v.). It has a trade in wine. Pop. 15,000.

Chiari, Pietro (1700-88), It. playwright, b. Brescia, rival of Goldoni. He started his career as a Jesuit priest, and in 1736 became prof. of rhetoric at Modena. He wrote some 60 plays in 12 years: *Commedie in versi*, 1756-62, and *Nuova Raccolta*, 1762. They are full of absurd intrigues and plots, and abounding in irregular invention. He also wrote operatic libretti and tales of adventure.

Chiari (anc. *Clarium*), It. tn, in Lombardy (q.v.), 14 m. WNW. of Brescia (q.v.). Prince Eugène (q.v.) defeated the French and Spaniards here in 1701. Textiles and chemicals are manuf. Pop. 14,000.

Chiarini, Giuseppe (1833-1908), It. poet and critic, b. Arezzo. For some time he was the director of the lyceum at Leghorn, and in 1884 was made director of the Liceo Umberto I at Rome. His poems are full of charm and tenderness, especially his *In Memoriam*, 1875, and *Lacrymae*, 1879, and the influence of Carducci is felt, whose principles he strongly advocated. A complete ed. of his works was pub. in 1902. The *Studi Shakespeariani* is a collection of his papers on Shakespeare. He also trans. Heine, and ed. works by Leopardi and Foscolo.

Chiaroscuro (Lat. *clarus*, bright; *obscurus*, dark), in painting, a word used to express the art of reproducing light and shade, in terms of tone rather than colour. It developed with the rise of oil painting, which allowed of subtle gradations from light to shadow as in the work of Leonardo or Correggio; and of depth and forceful contrast as with Caravaggio or Rembrandt. The C. woodcut was an engraving technique, a means of rendering sev. tones of one colour (see ENGRAVING). See also COLOUR PRINTING.

Chiasmus (Gk *chi*, *chi*, letter like our X) is a figure of speech by which contrasted terms are arranged crosswise, the order in one phrase being reversed in a second, as 'I cannot dig, to beg I am ashamed.' See also FIGURE OF SPEECH.

Chialotite, variety of the mineral andalusite (q.v.), which consists of silicate of alumina. Crystals of C. are long, narrow, and grey or white in colour. When broken across they often exhibit a cruciform pattern, and cut and polished crystals, giving a black cross on a lighter ground, are often worn as amulets by Sp. peasants. This pattern is caused by the fact that the outer portion encloses a darker one of regular geometric form. C. is met with in certain slates altered by the intrusion of igneous rock.

Chiating, or **Loshan**, in Szechwan prov., China, tn situated on the r. b. of the Min R., where it joins the Tatu R. It is a centre of the silk-weaving industry.

Chiatura, tn in Georgia (Transcaucasia), 30 m. E. of Kutaisi. It is the centre of the C. manganese-mining area, one of the

richest in the world, exploited since 1879. Pop. (1956) 19,000.

Chiavenna, It. tn in Lombardy (q.v.), lying N. of Lake Como (q.v.) at the junction of the roads to the Splügen (q.v.) and Maloja passes over the Alps. It was once an important trading tn. Pop. 3200.

Chiayukuan, or **Kiayukwan**, tn of Kansu prov. in China, situated at the W. end of the Great Wall, near Suchow.

Chiba, city of Chibaken, Japan, situated on Tokyo Bay, 20 m. E. of Tokyo. Pop. 134,000.

Chibchas, one of the civilised nations of S. America, whose kingdom at the time of the conquest in Colombia was almost equal to those of the Aztecs and Incas (qq.v.). The nation was divided into 2 states, which were hostile to one another. One was governed by the *cipa*, or king, of Bacata, and the other by the *zaque*, or lord, of Ramiriqui and Hunsu. Their total pop. amounted to over 1 million. Their empire was overthrown in 1538, and to-day they are a number of small communities, with a total pop. of under a million. Evidence of their great culture is seen in their stone temples, highways, statues, suspension bridges, and their beautiful gold and silver work, also their weaving and dyeing. See A. L. Kroeber, 'The Chibcha', in J. H. Steward, *Handbook of South American Indians*, vol. 3, 1946.

Chica, colouring matter of an orange-red shade which is obtained from a native plant (*Bignonia chira*) and made into a pigment by the Indians of the Upper Orinoco and Rio Negro; it is used by them to adorn their bodies. The name is also used for a beer in S. America.

Chicago, cap. of Cook co., Illinois, and second city of the U.S.A., on Lake Michigan, 724 m. W. of New York by air and 860 m. N. of New Orleans. A major centre of railway, highway, and aeroplane traffic, it extends 27 m. NNW. along the lake from the Indiana border, with an area of 213 sq. m. It is built on flat land scarcely rising above the level of the lake. The C. R. marks it off into N. Side, W. Side, and S. Side, characterised by long, regular, and straight streets. Great improvements have been made to the old city, although some slum dists. remain. Streets have been widened, bridges built, and boulevards constructed; land has been reclaimed from the lake for new parks, bathing beaches, and lagoons. The fine streets include the 7 following: State, Madison, La Salle, Clark, Dearborn, Wabash Avenue, and Michigan Avenue. There are more than 200 m. of boulevards. Not only office buildings but also the newer apartment buildings have steel frames; and the offices tower up to tremendous heights, accommodating thousands of people. Among the important buildings in the central business quarter may be mentioned the Chamber of Commerce, the Board of Trade, the City Hall and Co. Building, the Merchandise Mart, the Tribune Tower, the Wrigley Building, the C. Temple, the Marshall

Field Store, the Furniture Mart, the Civic Opera, the Prudential Insurance Co. of America, and the *Daily News* Building. Then there are the Art Institute, containing a valuable collection of pictures and other treasures, the C. Public Library, the C. Historical Society, the John Crerar Library, and the Newberry Library. The univ. of C., which dates from 1890, was endowed by John D. Rockefeller and is housed in a hundred buildings on both sides of the Midway Plaisance. The univ. has schools of divinity, medicine, law, business, and social service administration. There is also the Illinois Institute of Technology, and both Northwestern Univ. (see EVANSTON) and the univ. of Illinois (see URBANA) have C. campuses. C. is well provided with parks—in all, more than 7000 ac., many connected by boulevards. Lincoln Park (with a statue of Lincoln and a zoo) on the N. Side, Grant Park adjoining the business quarter, and Jackson Park on the S. Side border Lake Michigan and are connected by boulevards. Jackson Park and Midway Plaisance (which connects it with Washington Park) were the site of the 1893 World's Columbian Exposition. On the W. Side are Douglas Park, Garfield Park (with a conservatory), and Humboldt Park. There are many fine hospitals (including Cook Co. Hospital), and among other institutions are Hull House (a social settlement on the lines of Toynbee Hall, founded by Jane Addams) and C. Symphony Orchestra. Bordering Grant Park on the S. are the C. Museum (formerly Field Museum) of Natural Hist., Shedd Aquarium, Adler Planetarium, and Soldier Field. The park along the lake to the S. of them was the site of the Century of Progress Exposition (1933-4). The water supply of the city is extremely good, being drawn from the depths of Lake Michigan by a system of cribs and tunnels, while the (treated) sewage is carried by a canal into the Illinois R. This Sanitary and Ship Canal, opened in 1900, connects the C. R. with the Des Plaines R., and finally with the Illinois. C. owes its great advance in commercial activity to its advantageous position. In addition to being on the Great Lakes, it is an extremely good railway centre, connected by 27 railway systems with all parts of the U.S.A. It ranks among the largest commercial ports in the world, ships of over 7000 tons being able to enter the harbour. C.'s retail trade according to the census of 1949 amounted to \$4,270,000,000 in net sales. Just N. of the mouth of the C. R. a pier 3000 ft long was completed in 1915. Ships can also moor in the riv. and its branches. Among world grain centres C. holds the premier place. The grain consists chiefly of corn, oats, and barley, and the enormous grain elevators are a feature of the city. All kinds of manufs. are carried on, including iron and steel products, machinery, agric. implements, clothing, food products, and furniture. Printing and publishing are important. Thousands of agric. machines are made, the International Harvester Co. being

the largest manufacturer of such machinery in the world. At Pullman, in the S. of C., the Pullman car works produce the railway cars known by that name. The Western Electric Co., the largest manufacturer of telephone equipment in the world, has a large plant at Cicero, on the W. edge of C. The gov. of C. is regulated by a general charter law of 1872, the power being vested in a council elected from wards. The mayor, who is elected for 4 years, is at the head of the council, and appoints single commissioners



Canadian Pacific

MCHIGAN AVENUE, CHICAGO

to rule the different depts, all of which are under the power of the council. The growth of pop. in C. is remarkable, its increase during the period 1880-1950 being from 505,000 to 3,621,000. It is now the sixth largest city in the world. There is a large percentage of foreign-born, including Bohemians, Germans, Irish, Swedes, Norwegians, Poles, Italians, Russians, and Mexicans; indeed, in 1900 more than three-quarters of the pop. were either foreign-born or of foreign parentage. The origin of the name of the city is uncertain, but it is said to be the Ojibwa *she-kag-ong*, 'wild onion place.' The site was visited in 1673 by Joliet and Marquette. Fort Dearborn was built in 1803. In 1812 the Indians massacred the settlers. The fort was rebuilt 4 years afterwards, and in 1837 C. received its charter as a city. In 1871 it was swept by fire, with a loss estimated at

\$196,000,000. However, it was soon restored and was furnished with buildings of much better construction. In May 1886 occurred the Haymarket riot in which a bomb was thrown among the police trying to put down an anarchist meeting called owing to troubles in the labour world. The low number of European immigrants during the First World War brought about a great influx of unskilled Negro labour from the S. Difficulties caused by the return to normal conditions and the bad state of housing combined to cause a serious race riot in 1919, when, on one day, 38 people were killed and 537 injured. C. has never been noted for its orderliness; but from a time roughly coincidental with the enforcement of prohibition, crime and violence alarmingly increased. Gambling and bootlegging were the 2 main factors of violence, and enmity between rival gangs led to frequent shootings, the police or anyone else inclined to interfere being also shot down. During the First World War C. attracted attention through the anti-war, anti-Brit. attitude of its mayor, Wm. Hale Thompson, who was first elected in 1915. In May 1934 the most disastrous fire in C. since 1871 broke out in the Union Stock-yards. It destroyed the meat-packing centre and spread through 40 blocks, the total damage being estimated at \$6,000,000. C. is the H.Q. of one of the 6 army areas. See E. G. Mason, *Early Chicago and Illinois*, 1890; J. Kirkland, *The Story of Chicago* (2 vols.), 1892-4; E. D. Sullivan, *Look at Chicago*, 1930; E. L. Masters, *The Tale of Chicago*, 1933; I. F. Mather, *The Making of Illinois*, 1917 (revised ed. 1942).

Chicago, Milwaukee, St. Paul, and Pacific Railroad, a system with main lines from Chicago to Minneapolis and Seattle, and Chicago to Omaha. It operates more than 10,000 m., of which 565 m., mainly through the Rockies, are electrified.

Chicago, University of, was opened in 1892, initially endowed by John D. Rockefeller through the Amer. Baptist Educational Society, but is now undenominational. His gifts, 1890-1910, totalled \$34,700,000, and there were additional gifts amounting to \$49,700,000 from foundations he estab. and \$5,800,000 from John D. Rockefeller, junior. In 1950 the total of all gifts was \$171,600,000, and the permanent endowment was \$71,000,000. The univ. of C. is situated on the Midway Plaisance in C., Illinois, and occupies a number of imposing buildings, among which the Wm. Rainey Harper Memorial Library, a specimen of Eng. Gothic architecture, honours the first president, to whose genius it owes its initial success. Associated with the univ. of C. are a medical school, a law school, a school of business, a graduate school of social service administration, Baptist, Disciples of Christ, Congregational, and Unitarian theological schools, the Oriental Institute, Yerkes Observatory (at Williams Bay, Wisconsin), institutes for the study of metals and for

nuclear studies, the Argonne National Laboratory, and the univ. of C. Press, with an impressive list of pubs. There are a summer school and extension courses. The univ. of C. is open equally to men and women, the total enrolment in 1950 being over 12,000. The number of profs. and instructors was 771. In 1930, in place of the traditional graduate schools and undergraduate college, a divisional organisation was estab., consisting of the college, 4 upper divs. of arts and sciences, and the professional schools. See T. W. Goodspeed, *The Story of the University of Chicago*, 1925.

Chicago Heights, city in Illinois, U.S.A., 25 m. S. of Chicago. It manufs. chemicals, steel and iron products, and railway equipment. Pop. 24,550.

Chicago River, formerly a trib. of Lake Michigan. Its flow was reversed in 1900 with the construction of a canal (now known as the Sanitary and Ship Canal) to the Des Plaines R., and it has become a vital link in the Illinois Waterway.

'**Chicago Tribune**', popular Amer. daily paper, which entitles itself 'the world's greatest newspaper,' and one of the greatest financial successes of the newspaper world of to-day. The first issue was pub. on 10 June 1847, only 400 copies being printed, and the early years of the paper were full of financial vicissitudes. On one occasion it became bankrupt, but triumphantly overcame its difficulties and in less than 2 years paid off all its debts. In 1855 Joseph Medill bought an interest in the *Tribune* with 2 other purchasers, but it was not until 1874 that he took over the editorship from Horace White, who had been a part proprietor and editor-in-chief since 1866. Medill's genius raised the paper to a position of power during the many years it was under his control. In 1901 Joseph Medill Patterson, grandson of Joseph Medill, joined the staff of the *Tribune*, while his cousin, Robert Rutherford McCormick, 2 years later followed him. The united energies and abilities of these 2 young men were responsible for the rapid rise in circulation of the *Tribune*, and the serious attention they paid to advertising of a reliable and reputable nature soon raised the paper's financial status to great heights. A feature of the paper's foreign policy in the years preceding America's entry into the Second World War was Col. McCormick's isolationist and anti-Brit. attitude.

Chichas, S. Amer. people of the Gran Chaco, Argentina. They have their own large settlements, and cultivate the land in the Upper Bermejo dist., where they were known as 'mitimas,' or Peruvian colonists. They dress in a cloth which they weave themselves from the llama wool, and the Incas are said to have employed them in silver-mines.

Chichele, or **Chicheley**, Henry (c. 1362-1443), archbishop and founder of All Souls' College, Oxford. He was b. at Higham Ferrers, Northants, and educ. at Winchester and New College, Oxford. He became Bishop of St David's in 1408, and Archbishop of Canterbury in 1414. He was a royal envoy to France and

Rome on sev. occasions, and was an active opponent of the Lollards (q.v.). All Souls' was founded in 1437; C. also founded the C. Chest at Oxford for the relief of poor students, and gave generously to Canterbury Cathedral.

Chichén Itzá, ruined city of the old Maya empire in Yucatán, Mexico, 70 m. ESE. of Mérida. At one time a place of religious importance, there are many evidences of early civilisation in the time of the Itzás, a most powerful Maya nation, who were still inhabiting the city within 50 years of the Sp. conquest. There are a nunnery, a castle, and a central pyramid, the latter being 550 ft sq., with a height of 70 ft.

Chicherin, Georgiy (or Yuriy) Vasil'yevich (1872-1936), Russian diplomat. After graduating from St Petersburg Univ. he worked in the Archives Dept of the Russian Foreign Office. In 1904 he emigrated to Berlin and there joined the Russian Social Democratic Labour party, becoming a prominent member of the Menshevik faction (see MENSHEVIKS). For many years he was active in the labour movements of England, France, and Germany. After the Bolsheviks seized power in Russia in 1917 C. turned Bolshevik, and was imprisoned in Brixton Jail for having enemy associations. In Jan. 1918 he was released and expelled from Britain in exchange for Sir George Buchanan. After his return to Russia C. was appointed Commissar (Minister) for Foreign Affairs; he negotiated and signed the treaty of Rapallo with Germany in 1922. He resigned in 1930 owing to prolonged illness.

Chichester, cathedral city and municipal bor., cap. of W. Sussex, England, 28 m. W. of Brighton. A city rich in historical associations, it is situated on a plain between the S. Downs and the sea. The name is derived from the Saxon Cissan-ceaster, 'Cissa's Camp,' and called so after a Saxon king who took it in 491. Originally a Rom. station, it was demolished by the S. Saxons towards the end of the 5th cent. A wooden cathedral was erected at C. in 1108, and burnt down in 1114. Another cathedral was built on the same site in the 12th and 13th cents. It represents different periods of architecture, the choir above the arcade and the E. part containing excellent workmanship of the Early Eng. period. The special features of the cathedral lie in its nave with double aisles on each side, a detached campanile or bell-tower, and a number of portraits of the Eng. kings from the time of the Conquest and of many bishops. The spire is 300 ft high. Sir Gilbert Scott and others undertook the restoration of parts of the building, such as the central tower, a portion of the NW. tower, and the spire. Early Decorated, Norman, Perpendicular, Early Eng., and Late Norman styles are all in evidence in this cathedral. The tn itself has a fine market cross, octagonal in structure and belonging to the ornate Perpendicular style. The bishop's palace and cloisters are not far from the cathedral. Other buildings of interest are the church of

St Olave (Rom. workmanship), the Guildhall (formerly a Grey Friars' chapel), the church of St Andrew (the poet Wm Collins was buried here), and St Paul's Church (a fine modern structure). C. has a fine cattle market, and the chief trade is agric. produce and live-stock. Brewing and tanning are also engaged in. There are Rom. remains here. Pop. 19,110.

Chick-pea, or **Gram**, the *Cicer arietinum*, leguminous plant cultivated in India and S. Europe for food. It is bushy in habit, grows to a height of nearly 2 ft, has the pinnate leaves common to the family, and the pods are short, oblong, and 2-seeded; the flowers of this annual are solitary and of a pale violet colour. The seeds are about the size of an ordinary pea and bear a striking resemblance to a ram's head, hence the specific name. When boiled they form a nourishing article of diet, or when ground and made into pea-soup. In summer the plant exudes little viscid drops from the stem and leaves, and on evaporation these leave behind crystals of oxalic acid, to which its grateful refrigerating qualities are due. *Cajanus indicus*, a tropical leguminous plant, is sometimes known as C., its other names being Congo, or pigeon, pea and dahl. Its seeds also form an article of food, and are frequently used in curries.

Chickadee, black-cap titmouse, *Parus atricapillus*, a native of N. America. The name is onomatopoeic, imitating the note of the bird.

Chickahominy, riv. of Virginia, U.S.A. It is a trib. of the James R., which it joins 22 m. below City Point. In 1862 the battles of Fair Oaks, Mechanicsville, Gaines's Mill, Savage's Station, White Oak Swamp, and in 1864 Cold Harbor, took place near the riv.

Chickamauga Creek, riv. which takes its rise in Walker co., Georgia, U.S.A., and flows into the Tennessee 6 m. above Chattanooga. The Confederates under Bragg defeated the Federals under Rosecrans in Sept. 1863 on the banks of the riv.

Chickasaws, N. Amer. Indian tribe, of the Muskogean linguistic group and formerly one of the most warlike tribes of the Mexican Gulf area of the U.S.A. They gave great trouble to the Spaniards, and later allied with the English against the French. It is estimated there were 8000 in 1600, but to-day there are about 5000, mostly in N. Mississippi.

Chickasha, or **Chickasaw**, tn of Grady co., Oklahoma, U.S.A., on the Chicago, Rock Is., and Pacific railroad. Its industries include lumber, cotton, and cotton-seed oil, and it is in a rich petroleum-producing and agric. area. C. is the seat of Oklahoma College for Women. Pop. 15,842.

Chicken, see POULTRY AND POULTRY KEEPING.

Chicken-pox, or **Varicella**, mild, feverish, and infectious disease due to a virus, common among children. It can be distinguished by the appearance of successive crops of small vesicles, mostly on the extremities, which may not be very numerous; these seldom become

pustular, and dry up and drop off at about the fifth day leaving very little of the pitting or scarring which follows smallpox. It is not a dangerous disease, the fever being neither very high nor lasting. The period of infection ends when all the scabs have disappeared, and when the person affected has had an antiseptic bath. The virus of C. is related to that of herpes zoster (q.v.), and those in contact with a case of C. sometimes develop herpes zoster; but the reverse does not seem to occur. Encephalitis (q.v.) is a rare complication of C.

Chickweed, common name of many plants, particularly *Stellaria media*, a Caryophyllaceae annual that overwinters, loved by cage birds. *Cerastium* genus contains the Mouse-ear C.s. and *Tridentalis europaea* is the C. Wintergreen.

Chiclana de la Frontera, Sp. tn in the prov. of Cádiz, on the Atlantic coast. It has a ruined Moorish castle and mineral springs, and there is a fine beach near by. Linen and earthenware are manuf., and there is a trade in grain and wine. Pop. 14,000.

Chiclayo, important trading cathedral city, cap. of Lambayeque dept and C. prov., in N. Peru, with good road, rail, and port connections. Rice, cotton, and sugarcane are grown and processed. There are also tanning, distilling, and soapmaking. Pop. 32,650.

Chicle, see CHEWING-GUM.

Chicopee: 1. Tn of Hampden co., Massachusetts, U.S.A., on Connecticut R., 4 m. N. of Springfield. Tyres, sporting goods, textiles, clothing, firearms, machinery, electrical apparatus, bronzes, artillery, swords, tools, and motor cars are manuf. Pop. 49,210.

2. Riv. in the S. of Massachusetts, which flows in a westerly direction to join the Connecticut R. on its l. b. 4 m. N. of Springfield. Length about 18 m.

Chicory, **Succory**, or **Chichorium intybus**, family Compositae, a perennial herb with long tap-root and attractive sky-blue, double flowers, native of Europe, including Britain; related to the Endive, *C. endivia*. The green leaves and roots are bitter and aromatic and have been used in medicines for their tonic and diuretic properties. The blanched leaves make a tender salad, and for this purpose the variety Witloof is grown, and the roots lifted and forced in winter. Common C. or Barbe de Capucin (Monk's Beard) has looser, dandelion-like leaves, and special strains are grown for their roots, which, when dried, roasted, and ground, provide the chicory used as a substitute for or an adulterant of coffee.

Chicoutimi, city of Quebec, Canada, in co. of same name on R. Saguenay, 111 m. N.E. of Quebec. It has a large saw-milling industry. Pop. 24,400.

Chidambaram, tn of Madras state, India, 21 m. SW. of Cuddalore. It is a religious centre for the whole of S. India and Ceylon, and is the site of a number of fine ant. Hindu temples. Here also is the Anamalai Univ.

Chidley, see CHUDLEIGH.

Chief, see HERALDRY, Ordinaries (1).

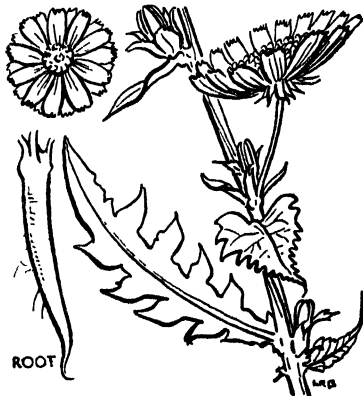
Chiemsee, lake in Germany, in the *Land of Bavaria* (q.v.), 12 m. E. of Rosenheim (q.v.). It lies in the foothills of the Alps (q.v.), 1683 ft above sea level. The lake contains 3 is.: *Herreninsel* has a former monastery (764) and a palace built for Ludwig II of Bavaria (q.v.) on the model of Versailles (q.v.); *Fraueninsel* has a fishing vil. and an 8th-cent. convent; *Krautinsel* is uninhabited. Area of lake 31 sq. m.; length 12 m.; width 7 m.; greatest depth 445 ft.

Ch'ien-Fo-Tung, see **CAVES OF A THOUSAND BUDDHAS**.

Chiang-mai, or **Zimme**, tn of Thailand, in the N., on the Me-ping R., 180 m. NE. of Moulmein (Burma). It is a centre of the trade in teak, the surrounding forests of which are, however, becoming exhausted.

Chieri, It. tn in Piedmont (q.v.), 9 m. SE. of Turin (q.v.). It is built on a hill, and has a Gothic cathedral (reconstructed 1405), and sev. other anct churches. It produces blankets and wine. Pop. 14,000.

Chieti: 1. Prov. of Italy, in E. Abruzzi e Molise (q.v.). It is mainly mountainous, with some high peaks of the Central Apennines (q.v.) in the W., but has a coastal plain on the Adriatic in the E. There are many fertile riv. valleys; the chief rlys. are the Foro and the Sangro. The prin. tns include C. Ortona, and Lanciano (qq.v.). Area 1018 sq. m.; pop. 404,000.



COMMON CHICORY

2. (anct Teate) It. tn, cap. of the prov. of C., built on a hill near the Pescara, 38 m. E. of L'Aquila (q.v.) and 8 m. from the Adriatic. It has a Gothic archiepiscopal cathedral, and Rom. remains, including 3 temples. The order of Theatines (q.v.) was founded here in 1524. There are textile manufs. Pop. (tn) 25,000; (com.) 40,000.

Chiffchaff, or **Lesser Pettychaps** (*Phylloscopus collybita*), small song-bird, one of the earliest summer visitants to Britain, and nearly allied to the willow-wren. The

head, wings, and back are greenish-ash colour and the nether parts yellow-white. Pettychaps is a name sometimes given to the garden warbler (*Sylvia hortensis*).

Chifley, **Joseph Benedict** (1885-1951), Australian statesman, b. Bathurst, New S. Wales. C. joined the New S. Wales railways as a shop-boy and became an engine driver. He was active in trade union affairs, entered federal politics in 1928 as member of the House of Representatives for Macquarie, later lost his seat but was re-elected in 1940. C. was minister for defence, 1929-32, treasurer, 1941-9, and minister for post-war reconstruction, 1942-5. Following the death of Curtin in 1945, C. became Prime Minister, remaining in office till 1949 when his gov. was defeated by a Liberal-Country party coalition. While in power his policy was designed to maintain full employment, and to provide the social services which have become standard in the contemporary welfare state. During his administration the commonwealth increasingly took the initiative in sponsoring projects for national development and in encouraging immigration. See *Things worth fighting for: speeches by Joseph Benedict Chifley*, ed. by A. W. Stargardt, 1953.

Chigger, see **CHIGOE**.

Chigi, or **Chigi-Albani**, name of a distinguished It. family. Among its most famous members have been:

Agostino (1465-1520), Rom. banker, b. Siena. He settled in Rome (1485), amassed a great fortune, and built there the Villa Farnesina (1508-11), enriching it with paintings, many either executed or designed by Raphael who also designed a private chapel in Santa Maria del Popolo for him. Agostino C. was patron of many other artists, including Peruzzi, Perugino, and Sebastiano del Piombo.

Fabio, **Pope** (1652-67), better known as **Alexander VII**. He was prominent in the Jansenist controversy, declaring for papal infallibility. He was involved in a dispute with Louis XIV of France, who sent an army to sack Avignon. He was responsible for the colonnade of the Piazza di San Peter.

Flavio (1810-85), cardinal. Began life as an officer in the Pope's noble guard; in 1848 took orders and became Bishop of Mira; in 1850 was appointed papal nuncio at Munich; in 1856 was papal representative at the coronation of Alexander II of Russia; in 1861 he went as nuncio at Paris, and in 1873 was created a cardinal.

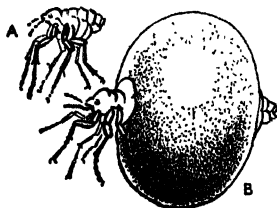
Chigirin (Ukrainian Chyhyryn), Ukrainian tn in Cherkassy Oblast, 130 m. SE. of Kiev. It was founded in 1589 by Poles. It was the residence of Bogdan Khmel'nitsky (q.v.) and from 1649 cap. of his Ukrainian Cossack state. Pop. (1932) 8000.

Chignecto Bay and **Isthmus**, inlet and neck of land which form the N. extremity of the Bay of Fundy.

Chignon (Fr. *chignon*, nape of the neck), form of hairdressing adopted by women about 1780, and again about 1870, consisting of an enormous coil of hair, folded

round a pad, and worn in the nape of the neck or at the back of the head.

Chigoe, Chigger, Jigger, and Sandflea, names applied to the *Sarcopsylla penetrans*, a species of Aphaniptera which is native to S. America and the W. Indies, but has extended its travels to other lands through the agency of man. The female (A) of this flea, which is smaller and has less powerful limbs than the common flea, buries the hinder part of its body under the skin of the human body, and when this portion of its anatomy swells (B) it discharges numerous eggs into the host. The result of this process is frequently fraught with serious and even fatal danger to mankind. *S. gallinacea*, a kindred species, attaches itself to the eyelids of the poultry of Ceylon. See also FLEA.



CHIGOE

Chigwell, urb. dist. of Essex, England, 13 m. N.E. of London, on the borders of Hainault and Epping Forests, and including the pars. of C., Buckhurst Hill, and Loughton. Wm Penn was a pupil at the grammar-school, founded in 1629 by Archbishop Harsnet of York, and enlarged in 1871. The Maypole Inn appears in Dickens's *Barnaby Rudge*. At Loughton are remains of a Brit. earthwork. Pop. 60,000.

Chihli, or Chih, prov. of China, see HOPEI.

Chihli, Gulf of, also known as the Pohai Bay, inlet of the Yellow Sea, between Shantung and the Korean Peninsula. The rivs. Hwang-ho and Yungting-ho discharge into it, and Peking stands at its head.

Chihuahua: 1. Largest state of Mexico, bounded on the N. by New Mexico, on the S. by Durango, on the E. by Coahuila and Texas, and on the W. by Sinaloa and Sonora. Area 94,831 sq. m. On the W. the country is traversed by the Sierra Madre or Mexican Cordillera; in the E. lies the Mexican plateau and the depression known as Bolsón de Mapimi. It is famous as the ter. of Pancho Villa and other patriots; also for the little hairless dog, the perro pelón. Nearly 40 per cent of all Mexico's mineral products are produced in C. (silver, gold, and copper are especially important). Stock-raising is carried on, and lumbering, cotton-growing, and agriculture are important. Pop. 846,414, consisting chiefly of mestizos (half-breeds), Indians, such as the Tarahumare, and thousands of Yankees and other foreigners.

2. Cap. of the above state, on the Mexican Central Railway, situated at an elevation of 4650 ft. The city was founded in 1707 by Father Francisco Muñoz, and has become cap. of the N., in a mineral-mining and stock-raising dist. Smelting, brewing, tanning, and cotton- and woollen-milling are carried on. The nearby Santa Eulalia silver-mines are specially famous. The buildings include a cathedral, Jesuit college, a mint, and a prison. Hidalgo and Allende, leaders of the revolution of 1810, were executed here, and a monument to their memory stands in the public square. There is an airport. Pop. 110,779.

Chilblain (*Erythema pernio*), local inflammation of the skin, which appears on the hands and feet, more rarely on the nose, cheeks, and ears. It chiefly affects children (girls rather than boys) and old people, and occurs in cold damp weather. It is due to exposure to the cold and to bad circulation. It is attended with redness and swelling, the centre of which deepens to a purplish hue. In severe cases small vesicles rise on the surface of the skin and ulceration follows. C.s. cause intense irritation, and, when chilled and suddenly heated again, are extremely painful. C.s. are uncommon in those who live or work in centrally heated premises. Exercise plays a part in maintaining circulation, and in this connection occupation is important. Except in states of real undernourishment, diet does not in the ordinary way play any part in the development of C.s. There is no real evidence that calcium is important, but the clinical results of giving calcium cannot be ignored. There is often a familial tendency to C.s., and psychological and nervous influences also play a part—no doubt through the release of endocrine factors which constrict the peripheral arterioles. The part of the body affected should be kept dry and very warmly and loosely clad. Broken C.s. should be kept scrupulously clean.

Child, Sir Francis (1642-1713), banker. Became a freeman of the Goldsmiths' Co. in 1684, and, through his marriage into a family of London goldsmiths named Wheeler, he inherited the Wheeler fortune and goldsmith's business. He was the founder of the banking business of C. & C. In 1698 he was elected Lord Mayor of London and M.P. (Whig) for Devizes. Subsequently he was elected for a London constituency. In 1702 he became master of the Goldsmiths' Co., and in 1727 president of Christ's Hospital.

Child, Francis James (1825-96), Amer. educationist and writer; b. in Boston, Massachusetts, U.S.A., he was educ. at Harvard Univ., and became prof. of rhetoric there in 1851. He became prof. of English there in 1870, and remained on the faculty practically up to the time of his death. He made a speciality of studies in Eng. literature, editing a monumental ed. of Spenser. But his supreme achievement was to make himself the world authority on auct Eng. and Scottish ballads. He pub. his first collection in 1857. Continuing his researches,

he gathered together the largest extant collection of MSS. on the subject and embodied the result of his studies in his famous book *The English and Scottish Popular Ballads*, pub. from 1882 to 1898, 'first in 10 parts (1880-98) and then in 5 quarto vols.' His other works include an ed. of *Four Old Plays*, 1848, and a treatise, *Observations on the Language of Chaucer's 'Canterbury Tales'*, 1883.

Child, Harold Hannington (1869-1945), scholar and literary historian, b. Gloucester. He was educ. at Winchester College and Brasenose College, Oxford. To the *Cambridge History of English Literature* he contributed more than any other single writer except George Saintsbury; while for the *Cambridge Modern History* he wrote on Milton and his age, and he also contributed to the *Dictionary of National Biography*. An authority on Shakespeare, he supplied the stage hist. of each play for the *New Cambridge Shakespeare*. His *Thomas Hardy*, 1916, is considered by some to be the best monograph on that writer. He also wrote *Phil of the Heath*, 1899, a novel; *The Yellow Rock*, 1939, poems; and the libretto of Vaughan Williams's opera, *Hugh the Drover*.

Child. In structure and functioning the C.'s body is similar to that of the adult. Organs similar to those found in an adult can be found in the C., and these will be found to function in a generally similar manner. Differences can be noticed in details, and the infant shows marked differences which become less marked as childhood progresses. The infant has, in proportion to the adult, a relatively large head and abdomen, small thorax and short legs, and long arms. At birth the head is one-quarter of the height, while in the adult it is only one-eighth of the height.

The skeleton of the child differs so much from that of an adult that an anatomist can, with a great amount of accuracy, determine the age of a skeleton, up to about 24 years. The difference, of course, is greatest, as in all cases, in infancy. Bones consist of organic matter combined with lime salts. In the C. the proportion of lime salts to organic matter is much smaller than it is in the adult. Further, the bones of a C. have provisions made for growth. A familiar example of this difference between the C. and the adult is the fontanelle, or 'opening in the head.' With the growth of the skull this disappears at about the eighteenth month, because the bones growing irregularly at their edges meet and fit into one another, forming what is called a suture, since the bones look then as if they had been stitched together. Again, at birth many of the bones of the body are not formed. They consist then of long rods of cartilage, a tough substance which can be cut with a knife. Lime salts are deposited on these in definite places, forming bone, until they consist of a bony shaft connected to the bony extremities by plates of cartilage. All through childhood the bone remains in this condition, but as maturity is reached the cartilage ceases

to grow as rapidly as the bone, and finally disappears, the extremities joining with the shaft, and growth of the bone in length stops. The bone grows in thickness also, by means of a surrounding tough membrane, called a periosteum. New bone is formed in the deeper portions of this, and at the same time the centre of the bone is absorbed, leaving the hollow wherein rests the bone marrow. These differences give rise to peculiarities, e.g. a C.'s bone may partially break (greenstick fracture); whereas in the adult a break snaps the bone, in a child the bone may merely bend. Again, the extremity may be separated from the shaft by the breaking of the cartilage. This can only happen to children, and may have serious consequences, since it affects the growth of the bone. The teeth of the C. at birth are hidden in the dental sacs, which are in the depressions in the jaws.

Alimentary system. The obvious point of difference between the infant and the adult with regard to the digestive organs is the absence of teeth. At birth the milk teeth are present in the gums, and teething usually commences at about the sixth month. The lower central incisors are the first to appear, and these are followed between the eighth and tenth month by the 4 upper incisors. The 2 remaining lower incisors and the 4 first pre-molars follow between the twelfth and fourteenth month. After a while the 4 eye-teeth appear at about the eighteenth month, and after a fairly long interval the set of 20 milk teeth is completed by the appearance of the 4 second pre-molars at the age of about 2½ years. This general order is not, of course, universally true, but in general it may be stated as such. In the same way the second dentition, giving rise to the permanent teeth, begins at about the sixth year, and continues at the rate of 4 teeth a year until the twelfth year, giving rise to 28 teeth. The full set of 32 is usually completed some time between the seventeenth and twenty-fifth year by the appearance of the wisdom teeth (the third molars). A healthy infant needs 2½ oz. of fluid per lb. of body weight in the 24 hrs. and in a similar period needs 50 calories per lb. of body weight. One fluid oz. of breast milk is equivalent to 20 calories. A baby weighing 10 lb. would therefore need 25 oz. of breast milk daily. A C. at birth is unable to digest starch. This is due to the absence of saliva, and this, and the consequent power to convert starch into sugar, only comes with the arrival of the teeth. During the first 6 to 9 months the C. should be given its mother's milk. The superiority of human milk over all other foods for infants, from the point of view of digestibility and nutritive value, is the unquestioned verdict of all authorities, and the risk of bacterial contamination, inherent in artificial feeding, is absent. There is some evidence that breast-fed babies are more resistant to infections. In those cases where artificial feeding must be resorted to, the best substitute for human milk is some modification of cow's milk, in which the constituents are

brought to the proportion in which they are found in human milk. Milk is an emulsion, owing its white colour to globules of fat. The following table shows the average compositions of human milk and cow's milk:

	Human Milk	Cow's Milk	Cream
Fat	4	3-4	8-20
Sugar	7	4-3	4
Proteins	1.5	4	3-4
Salts	0.2	0.7	0.6
Water	87.3	87	84-72
	100.0	100.0	100.0

Cow's milk differs in this respect, too, that the protein contained is not nearly so digestible as that in human milk, a dense curd being formed in the C.'s stomach, while when fed on human milk a flocculent, easily digestible curd is formed. To make cow's milk of the desired quality it must be diluted to reduce the proportion of protein, and cream and sugar of milk added. Cow's milk should *invariably* be boiled before being given to any C. up to the age of 12 years, owing to the very serious danger of bovine tuberculous and other bacterial infection (*see also* TUBERCULOSIS). Small amounts of mixed feeding should be introduced at about the fourth month and gradually increased. They should not result in a diminution of the quantity of milk taken. Between the tenth and eighteenth months the chief food should still be cow's milk specially prepared with the addition of other foods, such as porridge, puddings, eggs, etc. Infants and young children need a daily supplement of vitamins A, D, and C. From 1 to 3 teaspoons of cod liver oil will furnish a proper amount of A and D, and 2 to 3 teaspoons of orange juice a proper amount of C. Up to the sixth year a large amount of milk should be included in the dietary, which should consist of 4 meals a day. School children require abundant feeding.

Respiration and circulation. The lungs of a C. begin to expand with its first cry. The process of inflation then goes on very gradually, and the lungs do not attain their full expansion until the sixth year. Fresh air and exercise are essential for the possession of healthy lungs, and at the same time, by producing

before, the head is relatively very big and the face small in an infant, and this large size is due to the brain case. Its brain is enormous in proportion to the size of the body. It is not fully developed, convulsions following as the result of sense

impressions. The brain grows rapidly in size until the seventh year, the greatest growth occurring during the first year. After this period growth in weight slowly goes on until the adult stage is reached. It is to allow for this growth that the fontanelle or 'opening in the head' occurs. The skull around the brain case consists of 8 bones, partially developed at birth, but all joined up in the adult. The fontanelle on the top of the head is the last to close, and should be closed by the twentieth month. Before birth the impressions reaching the brain are few in number, but as soon as the C. enters the world, it is immersed in a flood of impressions. These cause the brain to develop. The different areas of the brain are all busy storing up impressions both sensory and motor, and association fibres are laid down which bring the different areas into relation with each other. A sense of security is all-important in building up a stable personality in infancy and childhood. Many adult neuroses trace their origin to a bad psychological environment in childhood. Regular periods of sleep, rest, and quiet should be provided, and in later childhood, both naturally nervous and rapidly growing children require careful management. In their outlook towards a highly strung C. parents should first examine their own psychological attitude to life. In the majority of cases imbalance in a C. is directly related to the behaviour of those to whom it is closest and from whom it has most opportunity to learn.

The growth of the child. At birth the C. should weigh about 7 lb., although 8 to 9 lb. is not uncommon. Then a steady

	Boys	Girls
First childhood	Up to 7 years	Up to 6 to 7 years
Later childhood	From 7 to 12 years	From 7 to 10 years
Puberty	" 12 " 15 "	" 10 " 13 "
Adolescence	" 15 " 16 "	" 13 " 14 "

active movements of the chest and diaphragm the action of the heart is aided. Clothes should be loose in childhood, and free exercise of the voice should not only be allowed but encouraged.

Nervous system. As has been stated

increase in weight and height during childhood. This growth is not uniform. During the first few days a loss in weight occurs which is made up by about the middle of the second week. During the first 5 months the daily increase should

be from $\frac{1}{2}$ to 1 oz., and from $\frac{1}{4}$ to $\frac{1}{2}$ oz. for the rest of the first year. At 6 months the weight should be doubled, and trebled at 12 months. At birth the infant is about 20 in. in length, and at the end of the first year it should be 8 in. taller, although it takes 6 years to double the height at birth. As an index of health the increase in height is not as useful as the increase in weight. From the appended table it may be noticed that with both boys and girls the most rapid growth occurs during the first year. At about the sixth and eleventh years occur further periods of rapid growth. Boys are heavier and taller than girls at birth, and always, excepting the thirteenth to fifteenth years when the girls are heavier, having

hand becomes the organ of touch. Until this stage is reached an infant has a great tendency to take everything to its mouth. Again, an infant is sensitive to changes of temp. Sight is present at birth, but the C.'s eyes may move independently, as may the eyelids, and there is no power of focusing. Further, they are usually only half open for the first few days, and a bright light may cause discomfort. Whether the C. really sees or not can only be verified when he follows a slowly moving object with his eyes. When this happens, then the C. begins to watch objects and persons, and soon begins to show pleasure in certain colours, thus showing the development of the sensation of colour. A sense of distance and

AGE	BOYS		GIRLS	
	Height	Weight	Height	Weight
Birth	20.6 inches	7.55 lb.	20.5 inches	7.16 lb.
6 months	25.4 "	16.0 "	25.0 "	15.5 "
12 "	29.0 "	20.5 "	28.7 "	19.8 "
18 "	30.0 "	22.8 "	29.7 "	22.0 "
2 years	32.5 "	26.5 "	32.5 "	25.5 "
3 "	35.0 "	31.2 "	35.0 "	30.0 "
4 "	38.0 "	35.0 "	38.0 "	34.0 "
5 "	41.7 "	41.2 "	41.4 "	39.8 "
6 "	44.1 "	45.1 "	43.6 "	43.8 "
7 "	46.2 "	49.5 "	45.9 "	48.0 "
8 "	48.2 "	54.5 "	48.0 "	52.9 "
9 "	50.1 "	60.0 "	49.6 "	57.5 "
10 "	52.2 "	66.6 "	51.8 "	64.1 "
11 "	54.0 "	72.4 "	53.8 "	70.3 "
12 "	55.8 "	79.8 "	57.1 "	81.4 "
13 "	58.2 "	88.3 "	58.7 "	91.2 "
14 "	61.0 "	99.3 "	60.3 "	100.3 "
15 "	63.0 "	110.8 "	61.4 "	108.4 "

grown more rapidly in weight from the eleventh to the thirteenth year. Between the twelfth and fourteenth years the girls are taller, but at all other times the boys are superior in height and weight. It may further be noticed that the increase in weight takes place between the intervals of greatest increase in height. Here it may also be pointed out that generally childhood can be divided into 4 periods as shown in the table on p. 362.

The table above, from *The Child: his Nature and Nurture*, by W. B. Drummond, 1915, shows the increase in height and weight from birth to the fifteenth year.

Mental development. At birth a C. is unable to interpret impressions arriving at the brain through the senses. The only way to judge as to the activity of the senses at birth is by the effects of stimulation as shown through movement. Taste is probably the first sense developed. Since smell is so closely linked up with taste it may be, and appears to be, present soon after birth. The sense of touch, however, is present almost from birth. It is present in a vague form before, and progresses rapidly. It is particularly developed in the lips and the tongue, and afterwards, of course, develops until the

conception of solidity depend upon a co-ordination of the senses of touch and sight. The sense of distance is very vague until the C. is a few years old, and while the recognition of solid forms is developed rapidly for near objects, this also remains vague for distant objects. Hearing, again, is absent at the time of birth, because there is no air in the drums of the ears. Loud sounds do not disturb, usually, until the third day or so, and, of course, this enables the C. to sleep without being disturbed. The power of localising sound may be developed by the fourteenth day, but not to any very great extent. From this and other observations it may be seen that the training of the eye should be aided by the training of the hand, and similarly it appears that speech depends on hearing. The lower senses, i.e. taste, smell, and touch, of course, enable the C. to develop sensations of hunger, thirst, warmth, the wholesomeness of food, etc. For a while after birth a C.'s movements may be classified as either random, reflexive, or instinctive. *Random movements* are common in infants, and they seem to depend neither upon will nor on any sensory stimulus. Among these might be noticed the stretching of the limbs of a young

baby. Older children also indulge in these movements during sleep. *Reflex movements* arise in response to sensory stimuli and are present at birth. Swallowing, sneezing, and even the first cry at birth may be taken as examples of this class of movements. *Instinctive movements* also arise from sensory stimuli, but are more complex. They may not all be instinctive, though some are. Seizing, raising the head, and creeping may be taken as examples of this type of movement. Seizing is possible at birth, and with great force, but an infant does not desire nor seize anything at sight, but only on coming into contact with it, until the sixteenth to the eighteenth week. Similarly with the raising of the head. This is impulsively done during the first few weeks, but the will to raise the head to see things shows itself about the second month.

The will. From these movements which are independent of will, the C. gradually assumes control over them, and wills to do them.

Play being the natural outlet for a C.'s energy is generally regarded now as being a preparatory exercise for life as it will be. Since the human is highest in the scale of animals, the time given up to play should be a long one, and is. It must, therefore, be seriously regarded when the subject of the C. and his development is under consideration. All this leads to the fact that modern systems of education need revision, and in the light of the special study which is being made of C. life, progress in methods of education is being rapidly made. One need only point to the kindergarten and nursery schools, manual and cookery centres, and the various clinics to see that there is a spreading tendency to view the C. as distinct from the adult in many ways.

Social services. Nurseries, infant welfare centres, pre-natal and post-natal clinics have all been considerably developed in recent years. Cheap milk and midday meals are provided by education authorities. The school medical service has been expanded to include treatment as well as inspection and to cover the system of part-time education up to the age of 18. In Britain family allowances are payable on behalf of each C. of school age in a family, except the first. The rates are 8s. a week for the second C., and 10s. a week for the third and each subsequent C. See CHILD STUDY.

Education. The Education Act of 1944 marks an important step forward in the educational system, which is now recast into 3 stages, primary, secondary, and further education. Facilities for technical education are being considerably increased. The school-leaving age was raised to 15 on 1 April 1947; as soon as possible it is to be extended to 16. Part-time education is to be compulsory for all up to the age of 18. See CHILDREN ACTS AND EDUCATION.

See S. Isaacs, *Social Development in Young Children*, 1937, and *Intellectual Growth in Young Children*, 1938; C. Bühler, *The Child and his Family*, 1940;

T. King, *Mothercraft* (11th ed.), 1943; J. Dalley, *The Gift of a Child*, 1946; D. Paterson and G. H. Newns, *Modern Methods of Feeding in Infancy and Childhood* (10th ed.), 1955; U. James, *Feeding in Infancy and Early Childhood*, 1956.

Child Adoption, see ADOPTION.

Child-killing, see INFANTICIDE.

Child Study includes now the anatomy, physiology, anthropometry, and psychology of the child as a child. Rousseau (q.v.) was the first to recognise that a knowledge of children and their ways is essential to anyone who wishes to reach them. Darwin was one of the first in England to publish observations of the development of a child, and since then the study has been carried out with great zest both here, on the Continent, and in America. Two methods are adopted in C. S.: the *individual* method which consists in as full a study as possible of a single child; and (2) the *collective* method, whereby sev. children are examined and studied for particular things, and an average or standard drawn up. Many of the results gained have been summarised under CHILD. It has been found possible to calculate the effects of the various lessons in the way of producing bodily and mental fatigue. School children in the same manner are medically inspected, and the results tabulated and conclusions drawn. The importance of all this cannot be overemphasised. As a direct result of C. S., kindergartens, and infant schools run on kindergarten lines, are now the only type of school for very young children. Play has been pressed into the service of the teacher, and freer and less-cramped movements are used from the beginning. 'Cramming' is recognised as being extremely harmful, and the deaf, the blind, and the mentally deficient are being trained in a scientific manner. A third, though not very practicable, method of C. S., is that which is given when spontaneous writings of children can be obtained. But, as the child is usually writing under the knowledge that his work is to be seen, it is very rarely of use. In studying children by the individual method, the child should be watched, much as a naturalist might watch an animal or insect, at work and at play, asleep and awake; but he should not be allowed to know he is being watched. This has been done in America by observation through glass panels, the child being unaware of the fact. Questions should be asked him, but he must not know that he is being questioned for a purpose, or he will probably become self-conscious and his replies studied. One great difficulty experienced by the child-studier is the finding of the correct motive for many of the child's actions; this is a matter of great importance, for it is only by discovering the motive that the right way in which to correct or encourage the child can be found. Sev. societies are in existence for the study of the child, chief among which are the National Froebel Foundation and the Parents' National Education Union. For list of books on this subject see CHILD, Education, and

the following: M. Montessori, *The Secret of Childhood*, 1936; A. Gesell, *The First Five Years of Life*, 1941; H. Edelston, *Separation Anxiety in Young Children*, 1943; A. Gesell and F. L. Ilg, *The Child from Five to Ten*, 1946, and, with L. B. Ames, *Youth: the Years from Ten to Sixteen*, 1956; S. Isaacs, *Troubles of Children and Parents*, 1948; C. W. Valentine, *Parents and Children*, 1953.

Childe, Vere Gordon (1892-1957), archaeologist, b. Sydney, New S. Wales, and educ. at a Sydney grammar school and at Sydney Univ., and at Queen's College, Oxford. From Oxford he returned to Australia and was private secretary to the New S. Wales premier, 1919-21. In 1922 he began to travel in Central and E. Europe, and in 1925 he pub. *The Dawn of European Civilisation* (new and enlarged ed., 1950) which set out a chronological framework for Central Europe, followed in 1926 by *The Aryans*. From 1927 to 1946 he was prof. of prehistoric archaeology at Edinburgh Univ.; in 1946 he became prof. of prehistoric European archaeology at London Univ. and director of its post-graduate Institute of Archaeology. He retired in 1956. Other pubs. include *The Most Ancient East*, 1928, *The Danube in Prehistory*, 1929, *New Light on the Most Ancient East*, 1934, 1956, *Man Makes Himself*, 1938, *Prehistoric Communities of the British Isles*, 1940, 1947, and *What Happened in History*, 1942.

Childebert I, King of the Franks (511-558), son of Clovis, inherited the kingdom of Paris; succeeded Amalric II, King of the Visigoths, at Narbonne in 531, and Sigismund, King of Burgundy, in 532.

Childebert III (c. 683-711), nominal King of Franks, 694-711; succeeded his father, Clovis III, but had no real power, the kingdom being in the hands of Pépin le Gros, mayor of the palace.

Childeric I, King of the Merovingian Franks, c. 457-81; succeeded his father, Mérovée, and left the throne to his son, Clovis I.

Childeric II, King of Austrasia from 656, and of Neustria and Burgundy from 689; succeeded his father, Clovis II, and left the throne to his brother, Thierry.

Childeric III, last of the Merovingian kings of France, 743-51; deposed by Pépin le Bref, and d. at St Omer in 754.

Childermas, see INNOCENTS.

Childers, Hugh Culling Eardley (1827-1898), statesman, b. London, and educ. at Wadham College, Oxford, and Trinity College, Cambridge. He went to Australia, settled in Victoria, and became an inspector of schools. In 1856 he was a member of the first Victorian Cabinet as commissioner of customs and trades. He helped considerably in the foundation of Melbourne Univ. In 1857 he returned to England as agent-general for the colony. In 1860 he entered Parliament as a Liberal. In 1864 he was made a civil lord of the Admiralty, and first lord of the Admiralty in 1868, and a member of Gladstone's first Cabinet. In 1880 he was in Gladstone's second administration as secretary for war, and as such was responsible for the

military operations in the first Boer War in 1880, and the Egyptian expedition of 1882. At the end of 1882 he succeeded Gladstone as chancellor of the Exchequer; his proposals for a conversion of consols were not carried out, and the defeat of his budget of 1885 led to the downfall of the ministry, though the real cause was the national dissatisfaction with the delays and mismanagement which had ended in the death of Gordon. He was home secretary in Gladstone's third ministry. See S. Childers (his son), *Life and Correspondence of the Rt Hon. H. C. E. Childers*, 1901.

Childers, Robert Caesar (1838-76), orientalist; civil servant in Ceylon, 1860. Under the guidance of Yátrámulle Unnānsé he studied Sinhalese, Pali, and the Buddhist sacred books. Returned to England in 1864, and in 1872 became sub-librarian at the India Office, London. In 1873 he became prof. of Pali and Buddhist Literature in Univ. College, London. Ed. Pali texts (1869-74) and compiled the first *Pali Dictionary* (2 vols., 1872-5); this became the foundation of Pali studies. In 2 papers (pub. in 1873 and 1875) he conclusively proved that Sinhalese, hitherto generally considered to be a Dravidian language, belongs to the Indo-European linguistic family.

Childers, Robert Erskine (1870-1922), author and Irish politician. He was the son of Robert Caesar C., and was educ. at Haileybury and Trinity College, Cambridge. From 1895 to 1910 he was a junior clerk in the House of Commons, and he was the author of an enthralling story of Ger. preparation for war, *The Riddle of the Sands*, 1903, and also vol. v of *'The Times' History of the War in South Africa* (where he had fought). During the First World War he was a major in the air force. He took an active part in the republican movement in Ireland, his interest in the country being derived from his mother—a Barton, of Glendalough, co. Wicklow. After the estab. of the Irish Free State (see IRELAND, *History* and SINN FEIN) C. supported those who refused to accept the Anglo-Irish treaty. He was captured by Free State forces, 10 Nov. 1922, and was executed at Beggar's Bush Barracks, Dublin, on 24 Nov.

Children, Adoption of, see ADOPTION.

Children, National Society for the Prevention of Cruelty to. The N.S.P.C.C. (incorporated under royal charter in 1895) is associated with the name of the Rev. Benjamin Waugh, by whose exertions the London Society for the Prevention of Cruelty to Children was formed in 1854. The object of this society was to discover and deal with cases of ill-treated and neglected children, and where it was necessary institute proceedings against offenders. The society became a national organisation in 1889 and during that year, largely as an outcome of its activities, the first Act for the Prevention of Cruelty to Children became law. Since then sev. other Acts have been placed on the statute book, and the Children Acts of 1933, 1948, and 1952 together with the Public Health

Act, 1936, constitute the basic legislation for the protection of children. Nowadays the N.S.P.C.C. is finding much to do in the rehabilitation of families who have become social misfits, and in this connection employs a growing band of workers whose duty it is to go into the homes of such families and give active help. In any one year, too, the society now receives applications from more than 10,000 parents for guidance and help in matters affecting their children. The society has under notice each year about 100,000 children (in addition about 22,000 come under the notice of the Royal Scottish Society for the Prevention of Cruelty to Children). Though in a few of these cases it is found necessary to bring a prosecution, decisive improvements can usually be brought about by other methods. Its H.Q. are at 15 Leicester Square, London, W.C.2. See also CHILD.

Children and Young Persons, Welfare of. As early as 1802 Parliament intervened to protect the moral and physical welfare of children in factories. The crusading zeal of Lord Shaftesbury, the novels of such writers as Charles Kingsley and George Eliot, and the vivid cartoons of Cruickshank so shocked the complacency of Victorian England that further efforts were made to ameliorate the hardship of children forced to work in industry for long hours under appalling conditions. Despite the useful pioneering work of voluntary bodies, it was not until the passing of the Education Act, 1870, that the State began its attack on mass illiteracy. The public conscience was shaken by the suffering and squalor of many children. Penal reformers urged that child offenders might be diverted from a life of crime if they were treated separately from hardened criminals. By the start of the present century it was beginning to be recognised that the welfare of the 'teen-ager' (in the formal language of the statute book, 'young person') required as much attention from the community as that of his younger brother. This article deals shortly with the concern of the Brit. welfare state for the needs of its citizens under the age of 18.

EDUCATION. Under the Education Act, 1944, parents are obliged to secure for their children between the ages of 5 and 15 years efficient full-time education. Local education authorities (i.e. co. councils and co. bors.) must provide free full-time education for all children between those ages in their areas. (See also EDUCATION.)

CHILDREN AND YOUNG PERSONS ACT, 1933. This Act consolidates previous statutes dealing with children and young persons. A child is defined as a person under the age of 14 years and a young person as a person who is at least 14 but less than 17 years of age. Some provisions of the Act are, however, concerned with the welfare of young persons up to the age of 18. The prin. parts of the Act relate to the prevention of cruelty and exposure to moral danger, employment, court proceedings, the remand homes, approved schools, and persons to whose

care children and young persons may be remitted. The provisions relating to employment are referred to in a later section of this article.

(i) *Prevention of cruelty, etc.* Sections 1-12 of the Act prescribe penalties for a number of offences against persons under 16. A person having the custody, charge, or care of a person under 16 who ill treats, neglects, or abandons him in a manner likely to cause unnecessary physical or mental suffering is liable to maximum penalties of £100 fine and/or 2 years' imprisonment. It is an offence to cause or encourage the seduction or prostitution of a girl under 16 or to allow a young person under that age to reside in or frequent a brothel. It is unlawful to allow or cause a person under 16 to beg, even if the begging is done under the pretence of entertaining or offering something for sale. A child under 5 years may not be given intoxicating liquor except on a doctor's orders, or in a serious emergency for health reasons. The prohibition of children under 14 in licensed bars, formerly contained in section 6 of the Act, is now to be found in the Licensing Act, 1953, which also stipulates that only intoxicating liquors in sealed and corked vessels for consumption off the licensed premises may be sold or delivered to a child under that age. This latter statute restricts the supply to persons under 18 years of intoxicating liquor for consumption on licensed premises. Section 7 of the Children and Young Persons Act, which is designed to discourage juvenile smoking, makes it an offence to sell to a person apparently under the age of 16 any cigarettes or cigarette papers, whether for his own use or not. It is also an offence for a tobacconist to sell tobacco other than cigarettes to such a person if he has reason to believe that it is for the use of that person. Constables and uniformed park keepers are under a duty to confiscate any tobacco or cigarette papers from any person apparently under 16 found smoking in any street or public place. A magistrates' court may order the removal of automatic machines for the sale of tobacco from premises believed to be extensively used by persons under 16. The Act prohibits pawnbrokers from taking pawns from persons apparently under 14 and dealers in old metal from purchasing old metal from persons apparently under 16. Anyone having charge of a child under the age of 12 who fails to take sufficient precaution against the risk of serious injury to that child by burning or scalding by contact with any open fire grate or heating appliance in a room is liable to a fine. The Act prescribes safety measures to be taken in any building providing an entertainment which more than 100 children attend.

(ii) *Protection of children and young persons in relation to criminal and summary proceedings.* Part III of the Act contains provisions for the treatment of children and young persons brought before the courts, whether as offenders, as being 'in need of care or protection,' or as witnesses.

(a) *The segregation of juvenile offenders.* Arrangements must be made to keep children and young persons awaiting trial from associating with adult offenders. Subject to certain exceptions, the police may release on bail any person under 17 years who cannot forthwith be brought before a magistrate. A young person not so released should, in the absence of certain specified circumstances, be detained in a remand home until brought before the court. With certain exceptions, offenders under the age of 17 must be tried by juvenile courts from which the general public is excluded.

(b) *Restriction of publicity.* Any court hearing proceedings concerning any offence or conduct contrary to decency or morality may prohibit the pub. in newspaper reports or any material likely to identify a child or young person involved in any capacity in such proceedings. Section 49 of the Act provides that no newspaper report of proceedings in a juvenile court shall contain particulars or pictures likely to identify any child or young person concerned in such proceedings; the court may, if satisfied that it is in the interests of justice so to do, modify the requirements of this section.

(c) *Court procedure affecting children and young persons.* The court may compel the attendance of the parents or guardian of a child or young person brought before it. No child may be present in court during the trial of any other person, unless his presence is required to give evidence. The court may order the public to withdraw whilst a child or young person is giving evidence in proceedings against a person charged with an indecent offence. The court may admit the unsworn evidence of a child of tender years if it considers that although incapable of understanding the nature of an oath, the child has sufficient intelligence and appreciates the duty of speaking the truth.

(d) *Juvenile offenders.* It is a legal presumption that no child under the age of 8 can be guilty of a criminal offence. In certain circumstances where a child or young person commits an offence for which a fine, damages, or costs may be imposed, the court may order the fine, etc., to be paid by his parent or guardian. A child or young person under 17 found guilty of an offence for which an adult could be punished by imprisonment may be sent to an approved school (see further under JUVENILE OFFENDERS). A child under 10 will not be committed to an approved school unless the court is satisfied that he cannot be suitably dealt with otherwise.

(e) *Children and young persons in need of care or protection.* The courts deal not only with young offenders but concern themselves also with children or young persons who are the victims of neglect or cruelty, are exposed to moral danger, or are falling into bad associations or are beyond control. A child or young person found to be in any of these categories is said to be 'in need of care or protection' and may be dealt with by a juvenile court by any of the following methods: (i)

committal to an approved school; (ii) committal to the care of any fit person willing to undertake his care; (iii) his parent or guardian may be ordered to enter into a recognisance (q.v.) to exercise proper care and guardianship; (iv) he may be placed for a specified period, not exceeding 3 years, under the supervision of a probation officer.

(iii) *Remand homes, approved schools, etc.* Part IV of the Act provides for the setting up and management of remand homes and approved schools. Approved schools (q.v.) may be classified so that a young person is sent to a school most appropriate to his needs (see further under JUVENILE OFFENDERS).

CHILDREN ACT, 1948. This Act, which implemented the prin. recommendations of the report of the Curtis Committee on the care of children, provides for the care and welfare of children deprived of normal home life. Local authorities have a duty to provide homes for children under the age of 17 years who have neither parents nor guardians or whose parents or guardians have abandoned or are incapable of maintaining them. Once a local authority has assumed responsibility for such a child, it may continue so to do until the child's 18th birthday. The local authority may by resolution assume parental rights over the child, to whom it then has a general duty to further his best interests and to see that he enjoys facilities and services available to children who have a normal home life (e.g. schools, hospitals, clinics, youth clubs). It may provide accommodation for children under its care either in an institution or with foster parents. The home secretary may make regulations providing for the welfare of children boarded out by local authorities. Local authorities may provide hostels for persons above compulsory school age and below the age of 21. In England and Wales all co. and co. borough councils, and in Scotland the councils of cos. and large burghs, must estab. children's committees to supervise the performance of their statutory duties affecting children. These duties are performed by children's officers whose appointments are subject to the approval of the Home Office, which also has a general supervision of the child-care work of local authorities.

CHILD LIFE PROTECTION. Part VII of the Public Health Act, 1936 (as amended by the Children Act, 1948), is directed to the protection of infant life and secures that foster-children are properly treated. A person who undertakes for reward to nurse and maintain a foster-child below the age of 15 years must give written notice of such undertaking to the local authority within a specified time which varies according to the circumstances. If a foster-child dies, or his residence is changed, or he is removed from the foster-parents, the latter must notify the local authority. The local authority may fix the maximum number of children under the age of 18 years who may be kept in any premises in which a foster-child is maintained. In order to enforce the provisions for the well-being and health

of foster-children in its area, the local authorities must appoint child protection visitors to visit such children in their homes; they have power to apply for an order for the removal of a child kept in insanitary premises, or by unsuitable persons.

CHILDREN AND YOUNG PERSONS (HARMFUL PUBLICATIONS) ACT, 1955. This Act was passed to prevent the dissemination of 'horror comics' and other pubs. which tend to corrupt a child or young person into whose hands they are likely to fall. It applies to any stories or pictures portraying the commission of crimes, acts of violence or cruelty, or horrible or repulsive incidents. Anyone who prints, publishes, or sells or lends such a pub. is liable to maximum penalties of 4 months' imprisonment and/or a fine of £100.

EMPLOYMENT OF CHILDREN AND YOUNG PERSONS. Part II of the Children and Young Persons Act, 1933, restricts the employment of children. No child under 13 years of age may be employed at all, except in authorised employment by parents or guardians in light agric. or horticult. work. No child of compulsory school age may be employed before the close of school hours during term-time, or before 6 a.m. or after 8 p.m. on any day, or for more than 2 hrs on Sundays or on a day during term-time, or in lifting or moving anything so heavy as likely to injure him. No person under 16 may be employed in street trading, although local authorities may make by-laws permitting persons under that age to be so employed by their parents. Children may take part in entertainments subject to conditions imposed by the local authority. The Act restricts the employment and training of children for dangerous performances. Persons under 18 may go abroad to perform for profit only on licence granted by a magistrate.

The Employment of Women, Young Persons and Children Act, 1920, prohibits the employment of children of compulsory school age in any industrial undertaking. The Factories Act, 1937, regulates the hours of work, overtime, and meal intervals of persons under 18 years of age employed in factories. Such persons must be given adequate training and supervision when working on dangerous machinery.

See APPROVED SCHOOLS, REFORMATORIES, AND INDUSTRIAL SCHOOLS; BORSTAL TRAINING; JUVENILE OFFENDERS; PROBATION.

See Clarke Hall and Morrison, *Children and Young Persons* (5th ed. by A. C. L. Morrison and L. G. Banwell, 1958).

Childrenite, rare mineral consisting of aluminium iron phosphate. It occurs in orthorhombic crystals, with hardness 4.5 and sp. gr. 3.2. It has been found in a few places in Cornwall and Devon. An allied species containing manganese is known as eosphorite, and occurs in Connecticut.

Children's Books. Although they form the second most important section of the book trade, books designed for the enjoyment as distinct from the instruction of

children date back only 200 years. In medieval times the only C. B.s were 'books of courtesy' containing instructions on behaviour and deportment; for amusement the child had to go to the grown-up romances, if indeed he was able to read at all. In the Elizabethan age he had still to be content with school-books or with orally transmitted tales of sprites and goblins, such as Shakespeare's *Mamillius* knew. In the Puritan period that followed he was still worse off, for gloomy religious handbooks were the fashion, a typically popular one being James Janeway's *Token for Children: being an Exact Account of the Conversion, Holy and Exemplary Lives, and Joyful Deaths of Several Young Children*. Books for young people's amusement may be reckoned to begin in the middle of the 18th cent. with such small vols. as *The History of Goody Two-Shoes*, which has been attributed to Goldsmith, but it was still insisted that they should point a moral, and Day's *Sandford and Merton*, 1789, showed to what depths of priggishness they could sink.

Even the pleasant *Original Poems for Infant Minds*, 1804, of Anne and Jane Taylor, usually had a lesson to impart, but from the beginning of the 19th cent. cheerfulness kept breaking in, as in the frivolous *Butterfly's Ball*, 1807, or the *History of Sixteen Wonderful Old Women*, 1821, which is the first appearance of the nonsense limerick. Edward Lear's famous *Book of Nonsense*, 1846, marked the end of the puritanical tradition, which was finally blown to atoms in 1865, when *Alice's Adventures in Wonderland*, by Lewis Carroll, as the Rev. C. L. Dodgson chose to call himself, ushered in a new era when cautionary tales were not only disregarded but mercilessly made fun of. From this time forward the whole aspect of juvenile literature was changed, and its output became so vast and developed so rapidly that it is simplest to consider its various types separately.

The fairy-tale, of which the *Alice* books may be claimed as examples, is of course of remote antiquity and was handed down orally long before it came to be printed. The great collection made by the brothers Grimm was trans. from the German in 1823; Hans Andersen's fairy-tales made their appearance in English in 1846; and between these dates there was pub. Lane's version of the *Arabian Nights*. The fashion was thus set for a succession of home-made fairy-stories composed by many leading Eng. writers. Ruskin's *King of the Golden River*, 1851, was followed by Thackeray's *The Rose and the Ring*, 1855, Kingsley's *Water Babies*, 1863, Jean Ingelow's *Mopsa the Fairy*, 1869, and George MacDonald's *At the Back of the North Wind*, 1871; and Andrew Lang, in addition to writing fairy-tales of his own, ed. a delightful series of collections, beginning in 1891 with the *Red Fairy Book*. There was also fairy poetry, of which Lewis Carroll's *Hunting of the Snark*, 1876, is an unorthodox specimen. Alfred Noyes's *Flower of Old Japan*, 1903, and *Forest of Wild Thyme*, 1905, have been

declared the best fairy verse since Drayton's *Nymphidia*; delicate fairy lyrics were written by Walter de la Mare and Rose Fyleman; greatest of all, the fairy drama, *Peter Pan*, by J. M. Barrie, made its appearance in 1904.

Animal stories, which form a class by themselves, derive partly from the fairy-tale and partly from the fable (q.v.). Southey's story of the Three Bears and the Uncle Remus tales of Brer Rabbit belong properly to the former category, but Anna Sewall's *Black Beauty*, 1877, a perennial favourite in which a horse tells its life story, started a new genre which has been greatly developed. Perfect of their kind were Kipling's *Jungle Books*, 1894, 1895, and *Just-So Stories*, 1902, which found the secret of giving individuality to creatures of the wild. The same principle, worked out differently in Kenneth Grahame's *Wind in the Willows*, 1908, made it an accepted classic. In a similar tradition were A. A. Milne's *Winnie the Pooh*, 1926, where the animal toys come alive, and Hilaire Belloc's earlier *Bad Child's Book of Beasts*, 1896. But perhaps the most successful writer of animal stories for small children was Beatrix Potter, who was almost exactly contemporary with Kipling, and whose *Peter Rabbit*, 1902, was followed by more than a score of other similar books that have a special charm of their own.

In the department of pure adventure stories for children defy exact classification, because they overlap with those intended for grown-ups. From the *Odyssey* to *Robinson Crusoe*, and from the tales of King Arthur to *Joanhoe* adult stories have been devoured by children, and there is a peculiar irony in the fact that *Gulliver's Travels*, that vitriolic satire, has been one of the most successful C. B. But adventure stories written specially for children are about a cent. old, dating from the appearance of R. M. Ballantyne's *Coral Island*, 1858, which was followed by many others of the same writer. Ten years later G. A. Henty led off with the first of his boys' books, many of which were highly topical, having such titles as *With Buller in Natal* and *With Roberts to Pretoria*. All these were outdone by R. L. Stevenson's *Treasure Island*, 1882, and his less inspired *Black Arrow*, 1888. A few years later came Henry Rider Haggard with *King Solomon's Mines*, 1885, and other tales of darkest Africa; and Conan Doyle's historical romances, *The White Company*, 1891, and *Sir Nigel*, 1906, started a vein which Kipling followed in the short stories of *Puck of Pook's Hill*, 1906, and *Reveries and Fancies*, 1910.

A separate section is demanded by the school story. It may be said to begin a hundred years ago with *Tom Brown's Schooldays*, 1856, by T. Hughes, which gives a fairly realistic picture of Rugby, and Dean Farrar's *Eric*, or *Little by Little*, 1858, a highly idealised story of a seaside boarding-school. Two main types of school story thus started simultaneously, and it may be remarked that in spite of sneers at its sentimentality *Eric* reached

its 36th ed. shortly after 1900. Both of these books were 'guyed' in Desmond Coke's satirical school story *The Bending of a Twig*, 1906, when *Eric* had already been ridiculed in Kipling's semi-autobiographical *Stalky and Co.*, 1899. The most successful writers were those who combined a minimum of sentiment with an abundance of humour, as did Talbot Baines Reed in *The Fifth Form at St Dominic's*, 1881, and others of his books. Among the best of his successors was R. S. Warren Bell, who wrote *Green at Greyhouse*, 1906, and other Greyhouse stories as well as editing a boys' magazine to which P. G. Wodehouse contributed some excellent school stories before he made his name as a humorous novelist. Another well-known novelist to produce a school story was H. A. Vachell, who wrote *The Hill*, 1905, telling of Harrow.

In the case of stories for girls, the overlapping between youth and age is very marked, for Charlotte Mary Yonge, who wrote nearly a hundred books intended for girls, of which *The Heir of Redcliffe*, 1853, is one of the best-known, was, by a reversal of the usual order, almost equally popular with grown-ups. Edith Nesbit, whose books, such as *The Treasure Seekers*, 1899, were the first to depict children as human individuals with characters of their own, wrote for both boys and girls, as did the more recent Arthur Ransome. But in America there was Louisa May Alcott's *Little Women*, 1868, which became a favourite on both sides of the Atlantic, the 'Elsie Books' of Martha Farquharson, beginning with *Elsie Dinsmore*, 1867, and 'Susan Coolidge', whose real name was Sarah Chauncy Woolsey, with *What Katy Did*, 1872, and its sequels. Girls' school stories came later than boys' because they had to await the development of women's education, but the vast output of writers like Elizabeth T. Meade and Angela Brazil bears witness to their popularity. The standard of modern publishing of C. B. has been encouraged and maintained by the Carnegie Medal in Britain (an ann. award by the Library Association for an outstanding C. B.) and the Newbery Medal in the U.S.A. (an ann. award by the Children's Library Association of America for the most distinguished C. B. of the year).

See Harvey Darton, *Children's Books in England*, 1932; Roger Lancelyn Green, *Tellers of Tales*, 1946; E. S. Turner, *Boys will be Boys*, 1948.

Childress, city of C. co., Texas, U.S.A. Pop. 7600.

Childs, George William (1829-94), Amer. publisher and philanthropist, b. Baltimore. In 1842 he entered the U.S. navy; became a book-store clerk in Philadelphia, 1843; set up as an independent publisher, 1847; became a partner in the firm of C. & Peterson, 1849. In 1864 he took over the *Philadelphia Public Ledger*. He wrote *Recollections of General Grant*, 1885, and *Personal Recollections*, 1890. His charitable work was considerable, and he erected public memorials to great men, including Herbert, Cowper, Leigh Hunt,

Moore, Shakespeare, Milton, Ken, and Andrews in England, and Edgar Allan Poe and Richard Proctor in the U.S.A.

Chile, rep. extending along the W. coast of S. America, to the S. of Bolivia, between the Pacific and the Andes; it includes also the greater part of the Fuegian Archipelago. Its existence as a rep. dates from 1810, when it declared its independence of the mother country, Spain. In 1880 C. annexed Atacama and Tarapacá, including the Lobos Is., and occupied the prov. of Tacna. Four years later Tarapacá and Tacna-Arica were formally ceded to C. by Peru, the latter prov. for 10 years only. For 17 years diplomatic relations between the 2 countries were severed, but in July 1928 they were resumed, and before a year had passed the dispute was settled, Tacna going to Peru, Arica remaining with C. The physical features of C. are very accurately known, as a gov. survey of an exhaustive nature was begun in 1848, and carried on for many years. Since the E. boundary of C. is, broadly speaking, the main chain of the Andes, the W. section, though in fact considerably elevated in some places, is everywhere low compared to the E. portion. The portion of the Andes between 31° 40' and 34° 20' S. lat. is the highest, the average height being about 16,000 ft. Two of the highest peaks of the Andes are Aconcagua (23,081 ft) in 32° 39' S., and Cerro Mercedario (22,211 ft) in 32° S.; other noteworthy mts are Pular (20,423 ft), Tolosa (20,140 ft), Juncal (19,880 ft), Chimbote (18,645 ft), and Osorno (8725 ft). The height of the Andes gradually diminishes from about 34° 20' S. There are a number of passes over the Andes connecting C. with the Argentine Rep., of which the best known are Bermejo (13,025 ft) and Iglesia (13,412 ft), on the Uspallata road; Pircas at a height of 16,962 ft; and Secompa (railway), 12,657 ft. There is a great difference in the breadth of the higher and lower sections of C. at different places. The land above 5000 ft extends in some places to within 10 m. of the coast; whilst in others, notably along the chief rivs., the land under 4000 ft extends for a distance of over 70 m. inland. In the N. the Chilean portion of the desert of Atacama lies between the coast and the mts, but to the S. of the desert, there are few spaces under 1500 ft. To the S. of 35° however, a region which rarely reaches this height extends from the coast for an average distance of 60 m. The general formation of this region is as follows: the highest part is nearest to the sea, and, rising abruptly from the coast, sinks eastward in terraces to an interior valley, or plain. This interior plain slopes gradually from N. to S. The Andes of C. are highly volcanic in character, and earthquakes frequently occur, the average number of shocks, of varying seriousness, felt at Coquimbo being about 40 every year. Perhaps the most destructive earthquake recorded in C. was that of 1751, when the former tn of Concepción was sunk in the sea, and the majority of places lying between 34° and 40° S. were destroyed;

on 19 Nov. 1822 the coast near Valparaíso was permanently raised 4 ft over 100,000 sq. m., and Valparaíso, Tuillota, Casablanca, and Limachi were destroyed; on 20 Feb. 1835 the rebuilt Concepción was again destroyed, together with Talcahuano; in 1868 Arequipa and Iquique were ruined, whilst in 1875 Iquique was again levelled with the ground. The rivs. of C. all flow from E. to W. across the country; even those flowing across the longitudinal interior valley mentioned above do so, which is a proof that the valley received its present slope after the rivs. came into being. In consequence of their direction, the rivs. are not of great length, and therefore of no great importance as means of transport. The most important are the quick-flowing Maipo; the Maule, which is navigable for a longer distance than any other; the Nuble; the BioBio, largest of all, but not navigable for large vessels even in its lower course; the Callecalle or Valdivia, which is the most important for navigation, as it has a good harbour at Corral at its mouth; and the deep Maullin, which drains Lake Llanquihue. Owing to the heavy rainfall of the S., many large lakes are found there, notably those of Llanquihue, Chapo, Ranco, and Lago de Todos los Santos, otherwise known as Lake Esmeralda. In account of the conformation of C., extending from 18° to 56° S. lat., the climatic conditions vary considerably, though extremes of heat are seldom observed owing to the influence of the cold Humboldt current. The place in which the greatest extremes are observed is the desert of Atacama; there the temp. varies frequently from 100° in the daytime to 36° at night. On the coast the temp. rarely reaches a greater height than 90°. The mean ann. temp. of Valparaíso is about 59°, that of Santiago 57°, and that of Valdivia 53°. In the longitudinal valley there is a mild uniform climate, the cold Humboldt current and cool winds from the Andes serving to mitigate the heat in summer, whilst in winter the overcast skies and the winds from warmer lats. serve to prevent excessive refrigeration. The rainfall is very low on the N. coast, but in the flord region of the S. it is much heavier. At Valparaíso the mean ann. rainfall is about 15 in., whilst at Ancud, in Chiloé, it is 130 in. The Chilean part of the desert of Atacama is as destitute of vegetation as the maritime region of Bolivia, and down to lat. 30° S. the coast has no vegetation, though inland some is found at about that lat. The vegetation of C., which is in full vigour about the lat. of Valparaíso, is remarkable for the large number of peculiar forms which belong to it. A very striking feature of the vegetation of C. is the small number of deciduous trees, when the high lat. of the region is considered. Among the more notable of the Chilean trees are the *Quillata saponaria*, or soap-tree, the bark of which is lined internally with a whitish saponaceous substance; the *Jubaea spectabilis*, a palm allied to the coco-nut, and yielding a sweet sap known as

palm-honey; the *Fagus obliqua*, an excellent timber tree; the *Fitzroya patagonica*, another very good and very common timber tree; and the *Eucryphia condifolia*, a foliage tree which grows to a great height and blossoms most luxuriantly in Feb. The apple-tree has been introduced with great success, and bamboos extend for a long way S., being used as fodder for cattle. Numerous twining and climbing plants are found, giving something of a tropical aspect to Chilean vegetation, such as the *Mutisia*, an asteraceous plant with blue flowers; the beautiful red *Tropaeolum speciosum*; and the gorgeous *Philesia burifolia*, which has

animal, and are very destructive of cattle. The chief of the other animals are the pudu, a small variety of deer, the coypu, or native beaver, the chinchilla, guanacos, and vicuñas in the mt. dists., and a variety of fish-otter. Many varieties of birds are found, among which may be mentioned ibises, parrots, flamingoes, herons, numerous species of small song-birds, and the Chilean swan, which has a pure white body and a black head and neck.

By far the most important mineral found in C. is nitrate of soda (or *salitre*), which is recovered from the desert of Atacama. For many years C. has been



E.N.A.

THE COASTAL PLAIN OF CHILE, BETWEEN VALPARAÍSO AND SANTIAGO

flowers shaped like a bell and of the colour of fire. The region between Valparaíso and Valdivia, which has sometimes been termed the garden of the New World, is the prin. centre of agriculture, though in other dists. great strides have been made in this science in recent years. Wheat is the prin. crop, but maize, oats, hemp, barley, beans, lentils, peas, and potatoes are also grown. All European fruit-trees flourish, and a large quantity of fruit is annually sent to the U.S.A. The vine is grown, and excellent wine is made—79,000,000 gallons in 1950, of which 3,800,000 were exported, chiefly to Belgium, Germany, Ecuador, and the U.S.A. Tobacco and the sugarcane are also cultivated. Pastures N. of the R. Maule feed immense herds of cattle; the hogs of the is. of Chiloé have given it a reputation for hams; and in addition numbers of horses and goats are reared. Dairy farming is increasing in importance, and in the S., in Patagonia and Tierra del Fuego, are extensive sheep-farms.

Chilean fauna is not very remarkable for variety; pumas are the chief wild

the only country to produce this mineral, which is therefore a very valuable source of revenue. The production figure was 3,162,800 tons in 1928, about 2,800,000 tons being exported. In recent years (owing to foreign substitutes) this has been kept down to 1,500,000 metric tons, mainly for export. In 1930 a law was passed constituting a national nitrate company (Cosach) with a capital of £75,000,000, to take over the whole nitrate industry with State participation, but in 1934 a new company was formed, the Nitrate Co. of Tarapacá and Antofagasta, consisting of over 30 companies comprised in Cosach, the Anglo-Chilean Nitrate Corporation, and the Lantaro Nitrate Co. All these together constitute the present organisation of the industry. The sales of these companies are effected through a central body called the Nitrate and Iodine Sales Corporation. The next mineral in importance is copper, of which there is a great abundance, the Tamaya mine, in the prov. of Coquimbo, being regarded as inexhaustible. C. is the world's second largest producer of this

metal, and provides not far short of one-fifth of the total ann. supply (nearly 361,000 metric tons in 1954). Silver is also found in fairly large quantities, the centre of the industry being Copiapo; a large number of mines yielding both gold and silver are in operation in Tarapacá, Guanaco, and Cachinal in Atacama, and Caracoles in Antofagasta. Another mineral of importance is lignite coal, of which the prin. beds lie to the S. of the Biobío to about 37° S. lat.; about 2,000,000 metric tons are mined annually. Deposits of iron ore in Coquimbo and Atacama yield annually between 1,000,000 and 2,000,000 tons; the new Huachipato national steel plant near Concepción is already turning out 300,000 metric tons of pig-iron. Many other minerals are found in smaller quantities, including manganese ore, sulphur, cobalt, zinc, antimony, tin, and salt. A new discovery of ore in Magallanes ter. has a potential output of 4 to 5 million metric tons a year. The number of manufacturing in C. is rapidly increasing; and in the last census there were some 460,000 employees in manufacturing estab. They include smelting works, breweries and distilleries, flour and saw mills, textile factories, tanneries, sugar refineries, and works for the manuf. of foodstuffs, starch, soap, paints, furniture, boots and shoes, glassware, biscuits, hosiery, hats, candles, matches, brushes, cordage, baskets, pottery, and cigarettes. The Chilean people are of Sp. language and physique, though there is a not inconsiderable admixture of native Indian blood. At the time of the Sp. conquest in the 16th cent. a native race calling themselves Mapuche (warriors) occupied the greater part of the present rep. of C. The Spaniards called the race Araucanians, and when they conquered the Incas they left the former in possession of a state of their own, to which was given the name of Araucanía. A portion of this area, along the slopes of the Andes from Copiapó to Chiloé, is still inhabited by them. Other tribes worthy of mention are the Changos in the N., an Aymará tribe; the Aíacaluf in the channels lying to the N. of the strait of Magellan; the Onas and the Yagans in Tierra del Fuego; and the Tehuelches, inhabiting part of the mainland of Patagonia. There is a considerable foreign element in C., chiefly Germans in the extreme S., natives of the Argentine Rep. in the N., and French, English, and N. Americans in the middle prov. The total trade of C. in 1937 was £34,411,000. In 1954 imports alone were valued at £118,500,000 and exports at £117,500,000. The mineral exports are by far the most considerable, and include nitrate and copper, and silver ores in large quantities, together with gold, guano, coal, iodine, borax, and manganese; wine, wool, cereals, vegetables, and fruit are among other goods exported. Exports of fresh bird guano are prohibited, but exports of fossilised guano, which began in 1934, are a valuable industry.

The chief imports of C. are machinery, oils, combustibles, textile goods, tools, and electrical equipment; most of the

trade is done with Great Britain and the U.S.A., the latter being the chief importer. The prin. ports for exports are Iquique, Pisagua, Antofagasta, Coquimbo, Valparaíso, Valdivia, and Punta Arenas. Valparaíso is by far the most important port for imports, two-thirds of the total entering here, whilst Iquique and Talcahuano come next in importance. There are 5444 m. of railway, both State and privately owned (State-owned, 3629 m.; Brit.-owned, 1815 m.), linking up the ports with the industrial centres; the railway from Valparaíso to Buenos Aires crosses the Andes at Uspallata (8843 ft) by a tunnel having a length of over 6 m.; 2 other lines cross the Andes to Bolivia. A convention between C. and Argentina, signed in 1922, arranged for the construction of 2 more trans-Andine lines, that via Salta being opened in Dec. 1950. C.'s main railway line, the Longitudinal Railway, runs from N. to S. with branches connecting with the ports. The Chilean trans-Andine line is now part of the State railway system. Aviation is highly developed between interior points and abroad. A plant for manufacturing aeroplanes was first estab. in 1930. There are 17 civilian and 12 gov. airports. There are telegraph and telephonic lines, and a chain of wireless stations extending along the coast. The constitution of C. dates from 1825, when that of 1833 was superseded. The president of the rep. is elected by direct popular vote; his term of office is for 6 years. Legislative power is in the hands of the National Congress, which consists of a Senate of 45 members and a Chamber of Deputies of 143 members. All voting is by ballot, and there is a universal suffrage for registered citizens over 21 years of age who can read and write. President González seemed to have strong support in the general election of Mar. 1948, but Carlos Ibáñez del Campo was successful in 1952, being elected for the usual term of 6 years. He had re-entered public life as a senator for Santiago in 1949. Until its disestablishment in 1925, the Rom. Catholic was the State church; it is still the chief religion; there are a cardinal-archbishop of Santiago, 2 archbishops, 16 bishops, and 2 vicars apostolic. Full religious toleration has been estab. since 1865. The condition of education in the rep. has been improved of late years; it is now free and compulsory for all children between the ages of 7 and 15. There are 2 univs. at Santiago and 1 each at Concepción and Valparaíso, technical and secondary schools with over 86,000 pupils, and public and private schools with over 800,000. There are, besides, professional and agric. schools, and schools of mines. There is a national library containing about 300,000 vols. Since 1900 military service has been compulsory, and conscription obtains in both the army and the navy. The army has 2000 officers and 20,000 other ranks. The navy is one of the most important in America, having 1 battleship, 2 cruisers, 10 destroyers, 3 submarines, etc. Area of the rep. 286,396

sq. m.; pop. (1940 census) 5,023,539; (1952 census) 5,930,000. The cap. is Santiago (q.v.), and other cities and towns are Valparaíso, Concepción, Temuco, Viña del Mar, Chillán, Talca, Antofagasta, Valdivia, Talcahuano, Iquique, and Magallanes. See W. E. Parker, *Chileans of To-day*, 1920; A. Edwards, *My Native Land*, 1928, and *The Dawn*, 1931; W. E. Browning, *Chile*, 1930; M. C. McBride, *Chile: Land and Society*, 1936; M. Mielche, *Land of the Condor*, 1947; G. J. Butland, *Chile* (new ed.), 1953; also V. Figuero, *Historical, Biographical, and Bibliographical Dictionary of Chile* (5 vols.), Santiago, 1931.

Chilecito, tn and cap. of C. dept., La Rioja prov., Argentina, in the Famatina valley, 45 m. NW. of La Rioja. Gold, silver, and copper are worked, and lumbering and food canning are carried on. Wines are also produced. The tn is connected with Cordoba by rail. Pop. 6000.

Chili, Chihli, prov. of China, see HOPEI.

Chilian, St., see KILIAN, St.

Chilianwala, vil. in W. Pakistan, 30 m. NW. of Gujrat. It was the scene of a decisive battle between the British and the Sikhs on 13 Jun. 1849. A large hydroelectric project is being developed at Rasul close by.

Chilina, or **Chilean Snail**, genus of gastropod molluscs representing the family Chiliniidae. The species are fresh-water pulmonates with larger pulmonary apertures than are to be found in any others of their sub-order, and their visceral commissure is unusually long. They inhabit Chile, S. Brazil, and Patagonia.

Chilka, great lake SW. of Puri (q.v.), in Orissa state, India. The lake lies between the hills of the E. Ghats and the sea, from which it is separated only by a stretch of sand. It is 45 m. long and averages 10 m. in width, and is renowned for guano of all kinds.

Chilkoot Pass, pass about 28 m. long over the Coast Mts in Alaska, U.S.A. On the route of an ancient Indian trail, it was at one time one of the chief means of reaching the Yukon gold-fields from the coast of Alaska. Thirteen miles from its starting-point, at Dyea, it reaches a height of 3500 ft.; it terminates at Lindeman, Yukon, Canada.

Chillán, cap. of Nuble prov., central Chile, 55 m. ENE. of the seaport in of Talcahuano. It is a thriving commercial city with trade in wine, vegetables, grain, and cattle and leather and flour industries in the midst of rich agric. country. Pop. 52,576.

Chilleothe, city, co. seat of Ross co., Ohio, 45 m. S. of Columbus. Manufs. include paper and food products, shoes, and furniture. Mound City Group National Monument is near. Pop. 20,100.

Chilling, or **Chill Hardening**, the process of cooling metals rapidly, so that the skin becomes hard, leaving the inner portion soft. Molten iron poured into moulds cools more rapidly at the surface than inside, the consequence being that a hard coating, capable of taking a polish and less liable to rust, surrounds the inner soft portion. Shot are chilled and hardened

by being allowed to drop through the air and thence into water. See also CASE-HARDENING.

Chillingham, par. (forming part of Glendale Rural Dist.), township and vil. on the R. Till in N. of Northumberland, 8 m. SW. from Belford railway station. C. Castle, the seat of the Earl of Tankerville, was built in the reign of Edward III; its park is part of an ancient forest. In the park is preserved a herd of wild white cattle. Pop. 100.

Chillingworth, **William** (1602-44), divine, b. Oxford. He was admitted to Trinity College, Oxford, 1618; became M.A., 1623, and appointed fellow of the college, 1628. He became a convert to Rom. Catholicism and went to the Jesuit College at Douai. His godfather, Dr Laud, Bishop of London, persuaded him to leave the Rom. Church. He quitted Douai and studied the claims of Protestantism, and eventually entered into the fold of the Eng. Church. He was conscientious, and declined to accept a preferment offered to him by Sir Thomas Coventry, keeper of the great seal, in 1635, because he could not subscribe to all the Thirty-nine Articles, and was opposed to the damnable clauses in the Athanasian creed. He wrote in 1637 *The Religion of Protestants a Safe Way to Salvation*, a famous polemic characterised by clear style and logical reasoning. He finally overcame his scruples and was promoted to the chancellorship of Salisbury (1638), and became prebendary of Brixworth in Northants. A staunch Royalist and believer in the doctrine of divine right of kings, he took an active part in the Civil war, was taken prisoner at Arundel Castle by Sir Win Waller, and d. at Chichester.

Chillon, 13th-cent. castle or fortress of Switzerland at the E. extremity of Lake Geneva, canton of Vaud, 2 m. SE. of Montreux. It stands on an isolated rock connected with the mainland by a wooden bridge. It was long a state prison, but is now a museum and an arsenal. Here François de Bonivard, a political prisoner, was incarcerated in 1530-6. See Byron, *The Prisoner of Chillon*.

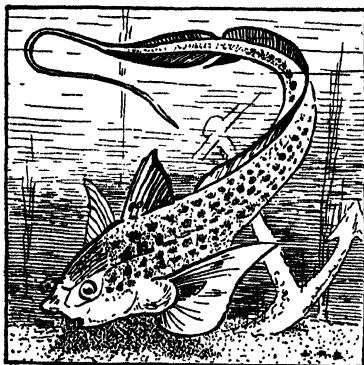
Chiloé Islands. These is. off the W. coast of S. America form, with other smaller is. and a part of the mainland, the prov. of Chiloé, Chile, with an area of 9053 sq. m.; pop. 96,250. The main is., 118 m. long by 35-40 m. wide, comprises 5 depts named after the chief townships, Ancud, Chacao, Dalcahue, Castro, and Chonchi. Castro, the ancient cap., is a seaport tn, and was founded in 1567. Another seaport, Ancud, is the prov. cap. and modern seat of gov. Pop. 4100. The climate is moist and healthy. Timber is exported. The other chief occupations are stock-raising and fishing.

Chilon of Sparta, one of the Seven Sages of Greece, who fl. 620-550 BC; the reputed author of the maxim 'Know thyself.' He held the office of ephor; is said to have d. of joy when his son gained the prize for boxing at the Olympic Games.

Chilopoda, see CENTIPEDE.

Chilpancingo, see GUERRERO.

Chilperic, name of 2 Merovingian Frankish kings: *Chilperic I*, assassinated in 584, was one of the 4 sons of Clotaire I. He tried to get possession of the whole kingdom on his father's death, but failed. *Chilperic II*, son of Childeric II, King of Neustria, battled with Charles Martel. He reigned 715-20.



CHIMAERA

Chiltern Hills, range of chalk hills clothed with beechwoods extending partly through the cos. of Oxon., Bucks, Beds, and Herts in England. The highest summit, near Wendover, Bucks, lies 852 ft. above the sea. They extend some 45 m. N.E. from the Thames at Goring. There is some beautiful scenery in the dist. which includes Ashridge, Hampden, Chequers, and other places of interest. See J. H. B. Peel, *Chilterns*, 1948.

Chiltern Hundreds. A member of Parliament who wishes to resign his seat takes the Stewardship of the C. H. An old Eng. statute declared that no member of Parliament, once chosen, could vacate his seat in Parliament. In 1707 it was ruled that a member could resign provided he held an office of profit from the Crown. Among these offices held by members of the House of Commons were 8 crown stewardships, but these did not fall within the terms of the statute of 1707, for no one holding these stewardships was exempt from parl. duties. It was not till the Place Act in 1742 that the appointment to one of these crown stewardships served as an excuse for resignation. Only 2 of these stewardships survived, viz. Chiltern and Northstead in Yorks. See PARLIAMENT.

Chivers Coton, par. and vil. of Warwick, England, mentioned in Domesday Book as Colverdestoche and now part of the bor. of Nuneaton (q.v.). The Coventry Canal passes through the par.

Chimaera (Gk for yearling goat), according to Homer (*Iliad*, Bk vi) a fire-breathing monster, with the head and

forepart of a lion, the body of a goat, and the hind quarters of a dragon. According to Hesiod it was a 3-headed monster, with the heads of a lion, a goat, and a dragon. It was slain by Bellerophon, with the help of Pegasus, in Lycia. The origin of the myth has been traced to the volcano of the name of C., near Phaselis, in Lycia: the summit of this mt was perhaps frequented by lions and goats, and the marshy land at its base by serpents. The term is often used figuratively to denote an unnatural fancy.

Chimaera: 1. Genus of fishes which is placed among the Elasmobranchs, to which the sharks and rays belong, and with the *Callorhynchus* forms the subclass Holocephali. They are distinguished by having 4 gill-clefts covered by an operculum, a few large teeth, no spiracle, 1 anal, and 2 dorsal fins, and a long thin tail prolonged into a filament. The species inhabit deep water in Europe and America; *Ch. collici* of N. America is known as the sea-cat, and *Ch. monstrosa*, the king of the herrings, is an ugly Brit. species about 4 ft in length, which is frequently captured by herring-fishers.

2. In botany, name used for the plants formerly known as graft hybrids.

Chimborazo, mt in Ecuador, S. America, one of the highest peaks of the Andes. Its height is 20,660 ft. In the 18th cent. it was thought to be the world's highest mt. It is an extinct volcano, with a snow-cap and 16 great glaciers. The first ascent was by Wympier in 1880. The mt gives its name to a prov. of Ecuador: area 2990 sq. m.; pop. 260,000; cap. Riobamba.

Chimbote, port of Peru, Ancash dept., starting point of the Santa railway to Huarás, which is 53 m. to the ESE. It possesses a good harbour in C. or Ferrol Bay. A new port has been built since 1950, and a steelworks of 60,000 tons ann. capacity is coming into production; while a new electrolytic zinc plant and a new sulphate of ammonia plant are under way. Many remains of a very early date have been found in the neighbourhood. Pop. 35,000.

Chimere (Fr. *simarre*, O.F. *chamarre*, a loose, light gown), outer robe worn by a bishop over a white rochet. In the Eng. Church the C., which, until the reign of Elizabeth, was of scarlet silk, is now of black satin. During episcopal conventions and when the queen attends Parliament the C. is scarlet. Cardinals and bishops of the Rom. Catholic Church in choir dress wore scarlet and purple C.s respectively.

Chimes, series of sounds given by a set of attuned bells in a belfry or church tower. The bells may number from 5 to 12 or more, usually rigidly fixed and struck by hammers or clappers being pulled against them, either mechanically, from a clock or chiming machine, or manually, from a simple keyboard. C. differ from carillons by virtue of the number of bells, carillons having not less than 25. See CARILLON. Chiming also refers to bells, or a bell, hung to swing, where the bell is only swung sufficiently to make the clapper

strike it, in contradistinction to ringing, where it swings through a full circle. See also BELL and CAMPANOLOGY.

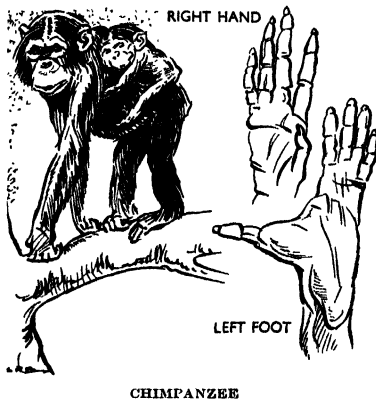
Chimkent, or **Tchimbkend**, tn of the Kazakhstan S.S.R. It lies on one of the sub-tribs. of the Syr Darya R., about 70 m. NNE. of Tashkent. Strategically and commercially the tn is very important, for it stands near the junction of 3 railway routes—from Fergana, Bukhara, Tashkent, Samarkand, and Stalinabad on the S., from the Aral Sea and Chkalov on the W., and from Alma-Ata and Semipalatinsk on the NE. This point is at the W. end of a valley which separates the Alexander range and the Ala-tau. Consumptive patients take the *koumiss* cure here. C. has lead refineries. Pop. 120,000.

Chimney, structure of brick, masonry, concrete, or metal, enclosing a flue, for the escape of smoke from the fire-place or furnace, and for the purpose of producing a draught to excite the combustion of the fire. Hot air is lighter than the cool air of the atmosphere, and consequently the air, heated by the fire, rises, pushing the smoke upwards. The draught caused by the escaping current of air is in proportion to the size of the C., a greater draught being produced by a high C. than by a small one. As the draught draws the fire and causes intense heat, the C. stacks attached to factory furnaces are built to a great height. As an example the Rollox shaft, Glasgow, may be mentioned, which stands 455½ ft high. The usual proportions are for the height to be 10 to 14 times the diameter at the base, and the diameter at the summit two-thirds of the lower diameter. C.s are usually constructed so that the draught and the smoke can be regulated by dampers. In manufacturing tns regulations have to be made for the good of the community as to the length of time a chimney may smoke. Further, C.s exceeding 100 ft in height must show a red light to give warning to aircraft. C.s are comparatively modern. In Gk and Rom. houses it was usual to have a hole in the roof for the escape of the smoke. C.s were first introduced into England, probably from Italy, in the late 12th cent., but were seldom used, and even in large houses there was only a central hearth in the great hall, the smoke escaping through a louvre in the roof. Fire-places against walls, and also C.-stacks, came into general use in the 16th cent. At first the flues were very large, causing the C.s to smoke. Elaborately carved C.-pieces of stone, marble, or wood became a feature of Elizabethan and Jacobean mansions. The term C. is used also to describe a narrow vertical cleft in rock, see ROCK CLIMBING.

Chimney Sweeping. Smoke from domestic and other fires burning bituminous coal deposits much soot in the chimney. In time this may reduce the draught, so that the fire will not burn properly and smoke may enter the room; it may also lead to a fire in the chimney which could have serious consequences. The chimney therefore needs to be cleaned out periodically. Formerly young boys were employed to climb up chimneys

for the purpose of cleaning them. They were subjected to such fearful cruelties by their masters that the matter was brought before Parliament, and Acts were passed regulating the employment of chimney-sweepers in 1840, 1864, 1875, and 1894. These laws enacted that no person under the age of 21 might ascend or descend a chimney or enter a flue for the purpose of cleaning it; that no child under 16 might be apprenticed to the trade; and that every chimney-sweeper must buy annually a licence costing 2s. 6d. The irritation of the soot frequently caused a disease known as chimney-sweeper's cancer. In 1805 George Smart invented a 'chimney-sweep' which superseded climbing boys. It was a stiff, radiating brush of rattan, fixed on to a long rod, which consisted of jointed sections of cane, and this form is still used. In recent years a method of cleaning domestic chimneys by suction has been introduced.

Chimonanthus, small genus of Calycanthaceae, contains only 2 species, both of which are natives of China and Japan, and are known as Jap. allspice. *Ch. nilens* is a beautiful evergreen, but *Ch. praerox* is a shrub which drops its leaves in Nov. The flowers come out about Christmas time or early in the New Year upon the naked branches, and yield a delicious fragrance.



Chimpanzee, popular term for the genus of anthropoid apes, or Simiidae, known technically as *Anthropopithecus troglodytes*. These apes are closely related to the gorillas, but they have longer limbs, and there is little difference between the sexes, except that the female is the smaller. They inhabit trees, in which they build night-shelters, and all are natives of Africa. Unlike the gorillas, they are gentle and playful, and when kept in captivity they exhibit much intelligence; unfortunately, the climate of N. lands proves too much for them after 2 or 3 years. Their diet consists chiefly of

fruits and nuts, but the C.s are also fond of animal food.

Chimu, tn of Colombia, dept Bolivar, 95 m. from Cartagena. Valuable treasure was found here by Heredia in the tombs of the Indians, who had developed a rich culture here in pre-Hispanic times. Pop. 4000.

China, tribe living in the Manipur area of Burma. They are agriculturalists and stockbreeders, living in very mountainous country. A man's wealth is measured by the number of cattle he owns, and meat is consumed in great quantities at public feasts, the giver of which acquires high social status according to the size of the feast. The higher a man's status so acquired, the greater is his position as notable, councillor, and law-giver. See H. N. C. Stevenson, *Economics of the Central Chin Tribes*, 1943.

China, now known as the Chinese People's Rep., is an extensive dominion of E. Asia of which C. proper constitutes the prin. portion. For cent. this dominion has been known as the Chinese Empire. It also includes the autonomous regions of Tibet, Inner Mongolia, and Sinkiang. Its most northerly point is about 54° N. lat., while its S. extremity, the is. of Hainan, is in lat. 18° N. From W. to E. it extends over more than 60° of long., from 74° E. to 135° E. This vast extent of ter., estimated at about 3,704,000 sq. m., is larger in area than Europe, which it approximately equals in pop. C. proper occupies the SE. portion of the country, and is bounded on the S. and SW. by Indo-C., Siam, Burma, and India; on the NW. by Kazakhstan; on the N. by Outer Mongolia and Siberia. On the E. is the Pacific Ocean, known by different names at various parts of the coast. Outer Mongolia seceded from C. in 1915, becoming an autonomous rep. in alliance with Russia after the 1917 revolution. In 1924 the U.S.S.R. acknowledged the suzerainty of C. over Mongolia, but by the Russo-Chinese treaty of 1945 it became completely independent. The country of Korea (Chosen), on the NE., was once a dependency of C., but the suzerainty was not much exercised during the middle of the 19th cent., and in 1895, after the disastrous war with Japan, the dist. fell under the control of the latter country. At the same time Formosa (Taiwan) became part of the Jap. Empire and so remained until the Jap. defeat in 1945. After the Sino-Jap. War, 1931-3, and the Jap. invasion of C., which was resumed in 1936, Manchuria, the N. Provs., and the greater part of the coastal regions of C. fell under Jap. control (see below, *History*).

TOPOGRAPHY. C. in the past has been characterised by exclusiveness, and development of this feeling has been rendered easy by the geographical situation. The country is cut off from the rest of Asia by high mt ranges and tablelands. Except by the sea, it was difficult for foreigners to penetrate. The coastline is almost all that of C. proper, though near the borders of Korea Manchuria has a short coastline.

From the borders of Korea about 240 m. of the coast are bold and rocky. Then come 360 m. of sandy coast; then 350 m. bold and rocky to the Gulf of Chihli; then 450 m. low and sandy to the parallel of the Chusan Is.; then 800 m. from Chusan to the Bay of Canton, mostly high, bold, and rocky. A number of low, sandy is. form the coast near Canton, westward of which there is an alternation of low and bold shores. The whole coast, counting only the larger promontories and inlets, extends over about 2250 m., though if all the indentations were accurately estimated the distance would be doubled. A considerable portion of C. proper is covered with mts, and the whole surface may be divided into the mountainous country, the hilly country, and the Great Plain. The mountainous country comprehends more than half of the whole, and the meridian of 112° E. may be considered its E. boundary, but to the N. of the Yellow R. (Hwang Ho) it extends as far as 114°. The hilly country lies to the E. of 112° E. and extends N. to the Yangtsekiang. The Great Plain occupies the NE. part of C. It extends in length some 700 m., from the Great Wall, N. of Peking, to the confluence of the R.s Yangtsekiang and Hankiang. Its width varies from 150 to 250 m. in the N. half, and from 300 to 500 m. in the S. half; the total area is about 210,000 sq. m. The W. end is the more fertile part, and it was to protect this from the inroads of nomadic Tartars that the Great Wall was erected about 200 years bc. This marvellous work extends over mts and rivs. for over 1400 m. The main substance of the wall is earth or rubbish, retained on each side by a strong casing of stone and brick, and terraced by a platform of square tiles. It commences at the Gulf of Liaotung, whence it extends westward to the Chiayu barrier gates. The thickness of the wall at the base is often as much as 10 yds. The mt system must be considered in relation to the surrounding dependencies. The N. of C. proper is bounded by the Alanshan and the Yin Shan which are a continuation of the Tianshan Mts of Siberia and Sinkiang. The same range then extends NE. as the Khingan Mts, entering Manchuria and ending at the Amur R. The Altyn Tagh Mts traverse the S. of Sinkiang, bound Tibet on the N. for a short distance, and continue in C. proper as the Nan Shan. Still further S. comes the continuation of the great range of N. Tibet, the Kunlun. This extension stretches right across C., separating the 2 rivs. the Hwang Ho and the Yangtsekiang, under the names of the Peilingshan, the Tainlingshan, and the Funiushan. All these mts gradually diminish in height as they move eastward, and become covered with the loess which forms so conspicuous a feature of N. C., and which contributes so greatly to its fertility. Almost parallel to the Kunlun, and forming a branch thereof, comes the Tangla range, which extends E. as the Tapashan. A S. branch of the Funiushan is the Hwaiyangshan. Offshoots from the Tangla range, itself a

branch of the Himalaya, and from the continuation of the main Himalayan range, run almost due N. and S. along the SW. boundary, chiefly through the provs. of Szechwan and Yunnan. However, the most extensive range of S. C. is the Nanlin or S. range, a spur of the Himalaya. It commences in the prov. of Yunnan and runs NE. in sev. parallel ranges to the Pacific, where it ends at the mouth of the Yangtsekiang. These ranges run through most of the S. coast provs.

Ho, which rises in Kansu. The Hwang Ho is 2600 m. long, but it is of little use to navigation. Chinese tradition tells of the part of the riv. in Shantung having changed its course no less than 9 times, and the surrounding country is in continual danger of inundation. As a result there are no large tns on this part of the coast. The Yangtsekiang (Takiang, or Great R.) also rises in Tibet where it is known as the Ulan-Muran, and flows in a SE. direction as the W. boundary of Szechwan. It makes a semicircular bend



E.N.A.

THE GREAT WALL OF CHINA, AT THE NANKOW PASS

The rivs. form one of C.'s conspicuous features. In the N. they usually bear the name *Ho*, in the S. that of *kiang*. There are numerous small independent rivs., but most of them fall into the Hwang Ho and the Yangtsekiang, 2 of the largest rivs. of the globe. They rise in close proximity in offshoots of the Kunlun range in Tibet. The Hwang Ho flows for a time parallel to the mts, and then makes a large sweep to the NE., through the prov. of Kansu. Its curve then follows the Alanshan range into Mongolia. Turning due S., it then forms the boundary between the provs. of Shensi and Shansi. At the S. of the latter it turns due E., again, and runs through Honan. It then inclines to the NE. before entering Shantung, and enters the Gulf of Chihli, N. of Laitchow Bay, by sev. mouths. Its chief trib. is the Wei

at the S. of this prov., and, after a tortuous course into Hupeh, it turns to the SE., then to the NE., then SE. again, and finally runs in a NE. direction to empty itself by an estuary into the E. Sea. This riv. is the chief waterway of C. Its total length is 3400 m., and along its banks are many flourishing cities, among which may be named Chungking, Hankow, Wuchang, and Nanking. The riv. is navigable by large steamers to Ipin and for junks to the border of Szechwan-Sikang-Yunnan. Its chief tribes, on the l. b. are Min Ho, the Chialing, and the Han, on the r. b. the Yuan and the Kan. The W. R. (Sikiang) begins at Hsuanwei in N. Yunnan and flows through Kweichow, Kwangsi, and Kwangtung. At Samshui its southward arm the Canton R. enters the S. C. Sea at the port of Canton. The Grand Canal,

or Yun Ho, is the oldest and longest in existence. It was commenced in 540 B.C. and is 1300 m. long. This great waterway commences at Hangchow, in the prov. of Chekiang, and extends to Tientsin in Hopei, where it joins the Pei, and thus gives direct communication with Tung and Peking. When the canal was in good condition it well fulfilled the purpose of its maker. Though it has now been largely superseded by steamer routes along the coast, its irrigation value has been enhanced by a recently built network of smaller canals crossing it. The rest of C. is also intersected with many canals, which connect various rivers and lakes. Parts of the country indeed are a veritable network of waterways. There are many lakes, but these are not on so large a scale as the rivers. Three only need be mentioned: (1) The Tungting, on the Yuan R., is about 250 m. in circumference. Two canals connect it with the Yangtse. (2) The Poyang, at the N. of the prov. of Kiangsi, is smaller than the Tungting, and about the same size as (3) the Tai, to the S. of Kiangsu.

Provinces. Mention has already been made of sev. of the provs. of C. proper. They are 21 in number, and may now be briefly enumerated. The first 7 extend wholly or partly over the Great Plain, the next 2 comprehend the hilly dists., 2 others the mountainous country along the sea; the remainder comprise mainly the mountainous country in the interior and W.: (1) Hopei extends over the most N. and less fertile part of the plain. In it are situated C.'s cap., Peking, and the important tns of Tientsin and Paoting. (2) Shantung comprehends part of the plain and the peninsula of Shantung. Chief tns: Tsinan, Yenchow, and the ports of Weihaiwei, Tsingtao, and Chefoo. (3) Kiangsu includes the low and swampy country on both sides of the Grand Canal. It contains the cities and tns of Chenkiang, Soochow, Nanking, and Shanghai. (4) Anhwei, on both sides of the Yangtsekiang, has for its chief tns Hefei and Hwaijing (Anking). (5) Honan, on the W. margin of the plain. Chief tns: Chengchow and Kaifeng. (6) Hupeh, in the centre of the plain, is one of the most fertile provs. Chief tns: Wuchang, Hankow, Hanyang, Siangyang, and Kingchow. (7) Chekiang, in the SE. of the plain, is the chief green tea prov. Chief tns: Hangchow, Wenchow, and the port of Ningpo. (8) Kiangsi, to the NW. of the Nanling range, is the great porcelain prov. Chief tns: Nanchang, Kiukiang, and Chian. (9) Hunan, in the hilly country, is rich in cereals. Wolfram is mined there. Chief tns: Changsha, Yungchow, and Hengyang. (10) Fukien, on the shores of the sea opposite Taiwan (Formosa), is the chief black tea dist., and one of the most fertile and flourishing of the Chinese provs. The chief tns are Foochow, Chuanchow, and the port of Amoy. (11) Kwangtung, the southernmost prov., contains the celebrated city of Canton, Swatow, and Luchow. Not far from Canton is the Brit. crown colony port of Hong Kong and the Portuguese

Macao. The is. of Hainan, to the S. of the Leichow peninsula, forms part of this prov. (12) Kwangsi, occupying both banks of the Sikiang R., is a mountainous prov., of which the chief tn is Nanning. (13) Kweichow is a very mountainous prov. to the N. of Kwangsi and is especially rich in minerals. Its chief tn is Kweiyang. Like Kwangsi, it contains aboriginal tribes, different from the Chinese. (14) Yunnan, the most S.-westerly prov., is an irregular table-land, and is rich in minerals; the 2 chief tns, Kunming and Yungchang, carry on a considerable trade with Burma and Indo-China. (15) Szechwan is a succession of hills and valleys, rich both in mineral and in vegetable produce. It now includes the E. part of the erstwhile Sikang prov. Its chief tns, Chengtu and Chungking, are places of great pop. and trade. Chungking, the Chinese cap. during the Second World War, stands on the Yangtse. (16) Shensi is a rugged country with wide fertile valleys; its chief tn, Sian, is very large, and was the anct. cap. of C. (17) Shanxi, adjoining the Great Wall, is a mountainous but fertile prov. Its chief tns are Taiyuan and Ta-tung. (18) Kansu, in the N., is sterile and thinly peopled. Its chief tns are Lanchow, Yinchuan, and the oil industry centre Yumen. (19) Chinghai, NE. of Tibet, is sparsely populated. The prov. is mountainous and the terrain in the valleys is generally unsuited for crops, but rich in oil and minerals. The chief tn is Sining. (20) Sinkiang, comprising the greater part of the area known formerly as E. or Chinese Turkestan, is the most westerly part of C., now an autonomous region, cap. Urumchi. (21) Taiwan, or Formosa, now has the status of prov. The is. has gold- and coal-mines, but the chief industry is agriculture, tea and sugar being exported. The cap. is Taipei. The N. area of C., stretching from the E. of Sinkiang to Manchuria in the NW., is the Inner Mongolia Autonomous Region. It formerly comprised the provs. of Ningsia, Suiyuan, Chahar, and Jehol. The provs. of Heilungkiang, Kirin, and Liaoning, and the municipalities of Harbin and Shenyang (Mukden), comprise Manchuria (q.v.). The Autonomous Region of Tibet is nominally a dependency of C., but preserves a great measure of independence. In 1914 a conference of delegates of C., Tibet, and Great Britain considered a Convention recognising the autonomy of Tibet proper (outer Tibet) and created a zone (inner Tibet) under Chinese authority subject to existing Tibetan rights. The Chinese Gov. did not ratify the Convention, though they accepted its terms in all respects save the boundaries between inner and outer Tibet. Shortly after the 1949 revolution, Chinese troops entered the country and it became an autonomous region under the supervision of the Peking gov., which maintains representatives at Lhasa, the cap. (see TIBET).

CLIMATE. The climatic conditions naturally vary considerably over so large a stretch of country. In the lofty Tibetan

		Area in sq. miles	Population 30 June 1954	Capitals
Municip.	Peking Tientsin Shanghai	169 133 191	2,768,149 2,693,831 6,204,417	
Chinese Provinces	Anhwei	55,092	30,343,637	Hofei
	Chekiang	39,020	22,865,747	Hangchow
	Chinghai	281,157	1,676,534	Sining
	Fukien	46,737	13,142,721	Foochow
	Heilungkiang	198,807	11,897,309	Harbin
	Honan	66,469	44,214,594	Chengchow
	*Hopei	153,783	35,984,644	Paoting
	Hunan	83,178	33,226,954	Changsha
	Hupeh	70,313	27,789,693	Wuchang
	(Jehol)	(67,186)	(5,160,822)	(Chengteh)
	*Kansu	263,828	12,928,102	Lanchow
	Kiangsi	64,956	16,772,865	Nanchang
	Kiangsu	40,583	41,252,192	Nanking
	Kirin	116,135	11,290,073	Changchun
	Kwangsi	84,894	19,560,822	Nanning
	Kwangtung	82,565	34,770,059	Canton
	Kweichow	68,139	15,037,310	Kweiyang
	Liaoning	92,165	18,545,147	Shenyang
	Shansi	62,487	14,314,485	Taiyuan
	Shantung	59,348	48,876,548	Tsinan
Autonomous Regions	Shensi	65,319	15,881,281	Sian
	(Sikang)	(182,511)	(3,381,064)	(Kangting)
	*Szechwan	155,843	62,303,499	Chengtu
	Taiwan	13,885	7,591,298	Taipei
	Yunnan	153,894	17,472,737	Kunming
	*Inner Mongolia	117,397 (?)	6,100,104	Huohot
	Sinkiang	633,804	4,873,608	Urumchi
	*Tibet, plus Chamdo Area	349,420	1,273,969	Lhasa
	TOTAL	3,700,000 (approx.)	602,000,000 (approx.) (including 11,743,230 oversea Chinese)	

NOTE. From 1951 to 1954 some provs. on the old map have been merged with those marked with * and have since lost their identity; e.g. the E. part of Sikang has been merged with Szechwan, its W. part with Tibet; Ningsia has been merged with Kansu; Jehol has been merged partly with Hopei, partly with Inner Mongolia, etc. Since the exact areas of the partitioned parts of these former provs. are not available, the areas of those provs. marked with * are provisional and subject to further confirmation. The area figure for Inner Mongolia is provisionally that of former Suiyuan. In reality it is probably much larger. The census was taken before the partition and merger of Jehol and Sikang.

plateau and the less elevated plains of Mongolia the climate is exceedingly dry, and is marked by great extremes of hot and cold. The basins of the 2 great rvs., being nearer the Pacific, are moister and more equable. In this part of C. proper the dry season lasts from Nov. to Feb., the remaining months, particularly May, being extremely wet. The rainfall S. of the Yangtse and in its valley is of a copious tropical nature. In N. C. there is little rainfall except in the summer. Generally speaking, C. is a cold country in comparison with European ters. in the same lat. From July to Sept., however, the weather is intensely hot, and the heat is accompanied by typhoons, which are much dreaded for their violent and devastating effects in the S. coastal provs.

AREA AND POPULATION. The area and estimated pops. (1954) of the provs. and municipalities of C. are given in the table above.

NATIONAL MINORITIES. The Chinese as a people are a mixed race and C. as a nation contains many nationalities. Broadly speaking most of the northerners are of Mongoloid stock, and part of the pop. of the S. coastal provs. bear distinctive features of the Malayan people. But as a result of mass migrations in the 5th, 12th, and 13th cents., when northerners were driven to the S. by the invasion of the Tartars, Nüchens, and Mongolians, and the settlement of the invaders in N. C., it is now difficult to tell whether a certain Chinese is of Mongoloid or Malayan origin. The early Tartars (and even the recent Manchus) had long been

assimilated by Chinese civilisation and they identified themselves with the Han (i.e. indigenous Chinese) people long ago. But in the mountainous hinterland and border areas there are aboriginal hill dwellers and immigrant foreign tribes who have retained their own languages, customs, religions, and costumes to the present day. In the past endeavours to assimilate them into the Han race met with little success, and discrimination against them produced much resentment. They are now recognised as national minorities and granted equal rights with the Han. They are about 40 million in all, of some 60 nationalities, constituting 7 per cent of the country's total pop. In NW. C. there are the Uighurs, Hui, Tibetans, Kazakhs, Tungshiang, Mongolians, Khalkhas, Tu, Uzbeks, Tartars, Tadzhiks, Manchus, Solon, and Sala, totalling 6,300,000, roughly one-fifth of the pop. in the area. In SW. C. are found Tibetans, Yi, Miao, Hui, Tai, Puyi, Minchia, Nansi, Kawa, and others who number more than 20 million, or 20 per cent of the pop. in the area. In Central and S. C. there are the Chuang, Miao, Yao, Tung, Hui, Li, Kuolo, Ling, Lai, and Maonan, totalling 8,500,000, or 5 per cent of the pop. there. In NE. C. there are the Koreans, Manchus, Mongolians, Hui, and Tahuerh. In E. C. are the Hui and Miao, and in Taiwan are the Kaoshan. The following table gives the approximate numbers of the larger national minorities groups, with the areas in which they live:

Nationality	Population	Main Centres of Habitation
Chuang	6,600,000	Kwangsi Prov.
Uighur	3,700,000	Sinkiang Autonomous Region
Hui	3,600,000	Kansu and Chinghai Provs.
Yi	3,300,000	Liangshan Mts on Sikang-Yunnan boundary
Tibetan	2,800,000	Sikang-Tibet Plateau and Chinghai Prov.
Miao	2,500,000	Kweichow Prov., W. Hunan, and other areas in Central, S., and SW. China
Mongolian	1,500,000	Inner Mongolia and Sinkiang Autonomous Regions, Kansu, Chinghai Provs.
Puyi	1,250,000	SW. Kweichow
Korean	1,100,000	Yenpien Korean Autonomous Region in Kirin Prov.
Tung	600,000	SE. Kweichow and N. Kwangsi
Yao	600,000	Kwangsi, N. Kwangtung and S. Hunan Provs.
Tai	500,000	Border areas in Yunnan

There are 3 big autonomous regions above the prov. level for the national minorities: (1) The Inner Mongolian Autonomous Region was estab. in 1947 and is the earliest of such administrative units. (2) The Sinkiang Uighur Autonomous Region, estab. in 1955, is the largest in area, approximately the size of France, Germany, and Poland put together. As there are 16 nationalities, including Russians, in that region, different autonomous dists. and autonomous cos. have been formed in areas where compact communities of nationalities are found. (3) To the Tibetan Autonomous Region has been added the W. part of the former Sikang Prov.

where Tibetans outnumber the Han Chinese. Apart from these 3, there are over 70 autonomous areas of dist. or co. administrative unit. The governors of autonomous regions, the vice-governors of provs. where there are autonomous dists. or cos., the head administrators of autonomous dists., and the magistrates of autonomous cos. are chosen from the minorities' own leaders. They also take part in the Central People's Gov. as vice-chairmen of the National People's Congress, vice-premier, and members of the State Council and National Defence Council. Their number of seats in the National People's Congress is greater than that of the Han Chinese in terms of proportion between the seats and pop. In each autonomous area the people's statutory rights to determine their own form of gov., to use their own language, to live their own way of life, to develop their own economy and manage their own finance, to draw up special regulations, and to organise their own local defensive forces are laid down in the existing (1957) constitution.

Communications. Owing to the topography of the country the development of communications in C. has been haphazard. In the E. coastal provs. the land is comparatively level and is intersected in all directions by roads and canals. Before the 1949 revolution practically all C.'s roads (approximately 100,000 m.) and its inadequate railways (approximately 11,000 m.) were built in this area, E. of long. 110° E., leaving

three-quarters of the country with only a few roads and hill paths. There were steamships plying ports along the sea coast and the main rivs., a regular air service between the main municipalities, and over 60,000 m. of telegraph lines before the Sino-Jap. War in 1937. Much damage and disruption had been done to all communications during the Jap. occupation and the ensuing civil war (1937-49). Since the estab. of the present gov. considerable improvements have been made. (1) **Railways.** The first railway in C. was built in 1870 from Shanghai to Wusung (12 m.), but its opening to traffic in 1876 caused such trouble that no work was resumed until

1881. In 1896 Russia secured from the Manchu Gov. the right to build a railway across Manchuria, linking her Siberian line with Vladivostok to the E. and a branch line due S. to Dairen. It is known as the Chinese E. Railway and its branch line is the Chinese Changchun Railway; there is a total of nearly 1500 m. in Chinese ter. It was in Jap. hands during the war, but Russia took it in 1945 after her declaration of war against Japan. By the 1945 Sino-Soviet treaty, based on the Yalta agreement, Russia secured the joint use with C. of this and other railways in Manchuria for 30 years. When the People's Gov. came to power, new treaties between C. and Russia were signed in 1950 and 1954, and the railways were handed back to C. in 1955. Other prin. railways built before the war are the Peking-Hankow railway (809 m.), Tientsin-Pukow (760 m.), Peking-Shenyang (565 m.), Peking-Paotow (545 m.), Nanking-Shanghai (207 m.), Shanghai-Hangchow-Ningpo (260 m.), Lunghai (Paoki-Haichow, 818 m.), Kiaochow-Tsinan (256 m.), Tatung-Puchow (546 m.), Yunnan (Tonkin frontier to Kunming, 313 m.), Canton-Hankow (730 m.), and Chekiang-Kiangsi (Hangchow-Chuchow, 665 m.). Of these pre-war lines the last two were built by the Nationalist Gov., and of the total mileage 40 per cent was concentrated in Manchuria. New railways built by the People's Gov. are Chengtu-Chungking (337 m.), built in 1951; Tiensui-Lanchow (231 m.) in Kansu, built in 1952; Tsining-Erhlun (225 m.), from Inner Mongolia to Outer Mongolian border; Fengtai-Shacheng (70 m.), from Peking to Inner Mongolian border; Peking-Chengtch (111 m.), all completed in 1955; Chengtu-Paoki (453 m.), from Szechwan to Shensi, and Paotow-P'olingmiao (99 m.) in Inner Mongolia, both built in 1956. The Lanchow-Sinkiang railway (1743 m.), being built along the anc. Silk Route, had finished its 600-m. section in the Kansu Corridor in 1956. When completed in 1959 it will be part of the Trans-Asian-Europe main line which is the shortest distance between the 2 continents. All these lines were built in the mountainous areas W. of long. 110° E. Other railways in S. C. and in the coastal provs. are Laiping-Munankuan (to Vietnam frontier, 280 m.), built in 1951; Litang-Tsamkong (207 m.), crossing Kwangsi and Kwantung, built in 1955; Lantsun-Yentai (122 m.), connecting the 2 ports Tsingtao and Chifoo; Yintan-Amoy (466 m.), with a branch, Nanping-Poochow (116 m.), from Kiangsi to Fukien; Chinchengkiang-Tuyun (205 m.) in Kweichow, all built in 1956. Other lines were built mainly in the industrial and forest areas. In addition, 8 pre-war trunk lines were double-tracked. The double-decked Yangtse R. Bridge, the longest in the E. hemisphere, connects the Peking-Hankow and Canton-Hankow railways in the centre of C. New railways under construction are Neikiang-Kunming (526 m.), Chungking-Kweiyang (227 m.), Kweiyang-Kunming (285 m.), Hunan-

Kweichow (370 m.), and Luchyang-Hankow (710 m.) in the SW.; Paotow-Lanchow (733 m.), Lanchow-Chinghai (1100 m.), and Lanchow-Chaohwa (400 m.) in the NW. Total mileage of railways built from 1952 to 1956 amounts to 3670 m., of which 815 m. were built in 1955, 1323 m. were built in 1956. Total railway mileage open to traffic in 1956 was over 18,000 m. Those railways leading to the outside world are the Chinese Changchun Railway and Lanchow-Sinkiang to Russia, Tsining-Erhlun to Outer Mongolia and Russia, Tunghwa-Chian and Shenyang-Antung to Korea, Kunming-Tonkin and Laiping-Munankuan to Vietnam. (2) *Roads*. Before the war there was a network of 4 S.-N. and 3 E.-W. trunk roads across the length and breadth of C. proper: S.-N. roads (a) from Kunming via Kweiyang, Chungking, Sian, to Yulin near the Great Wall (q.v.), passing 4 provs.; (b) from Munankuan via Kwellin, Changsha, Hankow, Kaifeng, Peking, to Mongolia, passing 8 provs.; (c) from Canton via Changsha, Loyang, Tatung, Paotow, Lanchow, to Sinkiang, passing 9 provs.; (d) from Canton via Foochow, Hangchow, Nanking, to Yentai, passing 5 provs.; E.-W. roads (a) from Wenchow via Chiniwa, Changsha, Kweiyang, to Kunming, passing 5 provs.; (b) from Shanghai via Nanking, Hefei, Nanyang, Sian, Lanchow, to Sinkiang, passing 6 provs.; (c) from Jihchao (in Shantung) via Tsinan, Kaifeng, Hanchung, Lanchow, Hami, to the Russian border, passing 6 provs. The surface of the pre-war roads was bad and many of the roads were unserviceable in rainy seasons. During the war the Burma Road from Kunming to the railroad at Lashio was hastily built, but it has not been in service since the war. New roads built since 1950 are mostly in areas inhabited by national minorities where previously there were no roads at all. Most important of all are two: the Szechwan-Tibet Road (1400 m.) from Ynan to Lhasa (q.v.), and the Chinghai-Tibet Road (1300 m.) from Sining to Lhasa. From Lhasa a road to Yatung (415 m.) on the Indian border, via Shigatse, Gyantse, and Phari (qq.v.), was open to traffic in 1955. In Sinkiang over 3000 m. of roads encircling the Gobi Desert and leading to the Russian border were built in 1956. Roads scheduled in the First Five-Year Plan totalling 7200 m. were completed in 1955. In addition, 9000 m. were built by various prov. govts., especially in Kweichow and Yunnan. (3) *Civil air service* was first inaugurated in 1929 with Amer. and Ger. air-liners. Total length of air-mail lines in 1936 was 8250 m. During the war, as all the coastal provs. were occupied by the Japanese, only a skeleton air-lift between Chungking and Hong Kong and Lashio, and later between Chungking and Calcutta, was maintained. Since 1950 regular air service has been reintroduced between Peking and the following cities: Shanghai, Nanking, Hankow, Chungking, Kunming, Nanning, Canton, Shenyang, Harbin, Sian, Lanchow, Urumchi, Kashgar,

and Lhasa. International service includes 3 lines, via Harbin, Urumchi, and Ulan Bator, to Russia, one via Lhasa to India, and one via Kunming to Burma. The Shanghai-Hong Kong line has not been restored, for political reasons. There is a daily service between Peking and Moscow, with occasional jet liners covering the distance of 6000 m. in 8 hrs. (4) *Navigation*. Before the war C.'s inland navigation was open to foreign vessels by various treaties. In 1938, 75,000 vessels entered and cleared Chinese ports, with an aggregate tonnage of 29,430,000. The percentages of this tonnage were: British, 48; Japanese, 24; Chinese, 8; French, German, Netherlands, and Portuguese, between 3 and 4. Since 1949 all foreign vessels have ceased to sail in Chinese rivers. Total navigable routes in inland rivers amounted to 67,000 m. in 1955, of which one-third is navigable by steamships, the rest being navigable by junks and sampans only. Goods transported by ships in inland rivers in 1954 amounted to 20.5 million tons. From 1953 to 1956, 400,000 tons of new ships were put to service, but coastal navigation in the Formosan Straits is not safe owing to the state of war existing between the Formosa and Peking govts. (1957). (5) *Post and Telegraph*. Postal service in C. was first estab. in 1896 throughout the country in the ports and cities. Owing to the war-time westward migration, service was extended to small towns in W. C., but villages suffered from inadequate facilities. Village postal routes were extended from 400,000 m. in 1950 to 890,000 m. in 1955, covering 80 per cent of the villages in the whole country. The other 20 per cent were covered in 1957. The total postal route in 1957 is 1.31 million m. Up to 1955 there were estab. 3000 vil. post offices and over 80,000 postal stations which also deal with circulation and distribution of newspapers and books. The telegraph lines had a total length of 60,000 m. before the war. In recent years 42,000 m. have been added. There are telegraph and telephone lines to most of the neighbouring countries and E. European states. (6) *Radio*. There are 55 broadcast stations in the chief cities, 5000 relay stations in smaller towns, and 41,500 reception centres in the vil. Radio Peking has a 2-programme, 19½-hour service in 3 languages: Chinese, Mongolian, and Tibetan. Overseas programmes are in English, Japanese, Korean, Vietnamese, Indonesian, Burmese, Siamese, and various Chinese dialects for overseas Chinese. These overseas programmes are mainly concerned with political propaganda and have undoubtedly had a considerable influence both on Chinese living outside C. and on non-Chinese Asiatics.

FLORA AND FAUNA. The flora and fauna are both that of the temperate and sub-tropical zone, so most of the common European and some African vegetables are produced and used. In the S. regions the S. fruits, such as oranges,

pomegranates, peaches, plantains, bananas, litchis, pineapples, and grapes, and the sugarcane flourish. In recent years coffee has been cultivated in Yunnan, and rubber on Hainan Is. The tea plant is extensively cultivated in the S. and W. provs. The use of tea as a beverage was mentioned in the *Book of Songs* (7th cent. BC), and it is universally used throughout the country. The larger and more ferocious kinds of carnivorous quadrupeds are not common in a country so well peopled and cultivated. The Bengal tiger sometimes appears in the forests of Yunnan and Manchuria, while the lion only occurs in sculpture. Old writers also speak of the rhinoceros, tapir, and elephant as common in C. Cattle, sheep, and horses are bred in W. C., Inner Mongolia, and Sinkiang, and the yak and the goat are bred extensively in Tibet. An animal peculiar to Tibet is the dzo, a cross between the yak and the zebu, which, however, reverts to the original types after the fourth generation. In the border of Tibet and Szechwan is found the giant panda, which was not seen alive outside C. until 1938, when some were brought to England.

AGRICULTURE. For the last 3000 years the Chinese have lived from their land. Canals for the irrigation of the paddy fields were dug in the Yangtze valley as early as the 6th cent. BC. In N. C., where wheat, millet, corn, and maize are cultivated, the Hwai R. and the Yellow R. are less manageable. The latter was known as the 'sorrow of China,' for it used to flood the countryside and had changed its colossal course 27 times from 602 BC to 1938, each time bringing disastrous loss of life and property. Famine was a frequent occurrence in the past in N. C., not because the nation did not produce enough grain to go round, but because bad transportation prevented surplus grain from being sent to deficient areas. Before the war coastal tns used to import rice from Saigon while surplus grain in Szechwan was burned as fuel. Since 1950 much irrigation work has been done and transportation of grain has been better organised. C. now claims to have some surplus grain, in addition to soya beans, to export in exchange for industrial equipment. Land reclaimed from 1953 to 1956 amounted to 8½ million ac. Her total area of arable land (in million ac.) and its production (in thousand tons) are shown in the table on p. 383.

In 1956 grain output was 199½ million tons, cotton output was 1.778 million tons. Of the grain the ratio between rice and wheat is roughly 4:1. In addition, the ann. output of soya bean is about 10 to 12 million tons.

LIVESTOCK. The steppe in NW. C. is traditionally the home of nomadic tribes. They are the Hui (Muslim), Tibetan, Uighur, Mongolian national minorities (see above) living in Chinghai and NW. Kansu, Tibet, Sinkiang, and Inner Mongolia respectively. Until recently they referred livestock raising to agriculture. In recent years agriculture as well as livestock raising has been encouraged by the

	1949	1952	1953	1954	1955
Arable land	244.7	269.8	271.3	273.4	274.8
Grain	113,180	163,915	166,830	169,515	174,800
Cotton	455	1,305	1,175	1,065	1,518
Jute	35	305	140	135	
Baked tobacco	45	220	215	230	
Sugarcane	2,640	7,113	7,210	8,590	
Sugar beet	190	480	505	890	
Peanut	1,270	2,315	2,125	2,765	
Rape seeds	735	930	880	875	

gov. in the minority areas. The Chinese peasants use bulls, horses, and donkeys to plough, and breed sheep and pigs to eke out their income. The numbers of livestock since 1949 in thousands are as follows:

Yunnan and Hunan are rich mining provs., producing tin, copper, iron, lead, silver, zinc, and molybdenum. Gold is mined in Szechwan, Kwangsi, and Heilungkiang, and diamonds have recently been found in W. Hunan. Mercury is

	1949	1952	1953	1954
Cattle	43,936	56,600	60,083	63,623
Horses	4,875	6,130	6,512	6,939
Donkeys	9,494	11,806	12,215	12,700
Mules	1,471	1,637	1,645	1,717
Sheep	42,347	61,779	72,023	81,304
Pigs	57,752	89,765	96,131	101,718

MINERALS. Chinese bronzes dated in the 2nd millennium BC show that both copper and tin were extensively mined in ancient C., but iron was not found until the 5th cent. BC. Gold currency was widely used in the 4th cent. BC, while silver appeared 2 cents. later. The use of natural gas in Szechwan was recorded in the 11th cent. AD, and Marco Polo's *Travels* tells of the extensive use of coal in N. C. in the 13th cent. In modern times C. has been an underdeveloped country. Geological survey did not begin until the first rep. was founded in 1911, and little prospecting was done before the war. Pre-1939 estimation puts coal at 248,287 million tons, next only to U.S.A. and Canada, mostly in Shansi (1500 sq. m.), Shensi, Kansu, Hopei, Honan, Liaoning, Hunan, and Kiangsi. Recent intensive prospecting has shown that there are coal-mines in practically every prov., and C.'s coal reserve might be much greater than that of Canada. Iron reserves were previously estimated at 1200 million tons, mainly in Liaoning. Recent prospecting has discovered 2 more iron-mine centres, one on the Hopei-Kiangsi border and the other in Inner Mongolia near Paotow, each containing greater reserves than those of Liaoning. Oil was discovered before the war in Yumen, in NW. Kansu, and new discoveries have been made in the Tsaidam Basin in Chinghai, in Dzungaria in Sinkiang, and in W. Szechwan. Oil shales are found in Liaoning and Kansu. Oil fields in Sinkiang and Tsaidam began production in 1956. C. has 10 per cent of the world's antimony in Hunan, and the world's second largest reserve of tungsten was discovered in Kiangsi and Hunan in 1915. Her pre-1939 output of manganese was about 100,000 tons a year.

produced in Kweichow and Shensi. Among non-metal minerals is sulphur, found in Shansi and Kansu; and half of the world's alumina is produced in Chekiang. The Kaoling clay, raw material for porcelain manufs., is supplied from Kiangsi and Anhwei. The deposit of this clay in Chingtehcheng alone is 45 million tons. Mine-salt is tapped from Szechwan, Yunnan, Kansu, and Inner Mongolia. Yunnan yields a number of precious gems, while jade is an age-old commodity from Sinkiang. Among other natural resources is a water-power potential of over 450 million kilowatts of hydro-electricity from her 1500 rvs., of which 72 per cent are in SW. C. The Tsangpo R. in its 200 m. bend downstream from Shigatse in Tibet is capable of producing 50 million kilowatts.

INDUSTRY. C. has been credited with 3 great inventions: printing, gunpowder, and the compass. Prior to the invention of printing was the invention in the 1st cent. of paper which was originally a by-product in her silk industry, which dated back to the 13th cent. BC. Printed books first appeared in the 10th cent., and a cent. later the movable type was invented by Pi Sheng. The oldest silk textile preserved in C. is a sarsenet from the 5th cent. BC, on which are painted a lady, a phoenix, and a serpent. Chinese silk textile found its way to Europe via Parthia and Persia at the beginning of the Christian era. As early as the 15th cent. C. exported a considerable amount of porcelain, the best of which is to this day unexcelled by that of any other country—indeed the very name 'china' bears witness to the credit of its country of origin. When in the last cent. Chinese ports were thrown open to the W. world, her main export items were silk and tea,

but her imports were more than her exports. After 1872 C. had an unfavourable trade balance which lasted till 1950. Her attempt to establish modern industry began in the 1880's,

export. The product of cotton yarn in million bales (10 metres to a bale) and cotton textile in million bolts (excluding production from farmers' looms) is shown in the following table:

	1949	1952	1953	1954	1955	1956
Cotton yarn	1.8	3.62	4.1	4.6	4.9	5.2
Cotton textile	30.18	89.27	107.8	122.3	140.5	176.5

but successive civil wars hampered its development. Steel production in 1907 was 8500 tons, in 1933, 25,000 tons. Not until the First World War did C. have any sizeable light industry such as flour and cotton mills, cigarette and match factories, etc., for the home market. In the treaty ports foreign-owned factories helped to develop the economy, but native industry had to face keen competition. At the turn of the cent. Chinese tea met with the competition of Indian and Ceylon teas, Chinese silk met with the competition of Jap. and It. silks, and her export of both these commodities fell rapidly. A recovery was made later, and before the Second World War a quarter of the world's supply of silk came from C. In 1937 her total export of raw silk amounted to 4 million lb. The chief silk-producing provs. are Chekiang, Kiangsu, Kwangtung, and Szechwan, where the silkworm is fed on mulberry leaves, while in Shantung and Liaoning it is fed on oak leaves. In 1955 silkworm eggs were flown to Sinkiang and skilled workers from Kiangsu were sent to build the industry there. Silk textile produced in 1956 amounted to 70 million metres. C. ranks next after the U.S.A. and India in her cotton production, but, owing to the growth of her own mills, she received supplies of raw cotton from both these countries in the past and from Pakistan and Egypt recently, in spite of the expansion of her cotton-growing acreage. C.'s total spindles in 1952 were 5,660,000. Her textile factories were at first concentrated in the trading ports, Shanghai, Tsingtao, Tientsin, and Hankow, cities remote from the cotton-growing areas. To rectify this anomaly the Ministry of Textile Industry claims to have built, 1953-5, 19 major textile mills totalling 1,420,000 spindles and 45,000 powered looms in Peking, Hantan, Chengchow, and Sian, and many small mills in other tns. Cotton was for the first time grown in 100,000 ac. in the Manass R. Basin, Sinkiang, in 1955, and in Shigatse, Tibet, in 1956. With the increase of the number of sheep to 4 times the pre-war figure, the wool textile industry in NW. C. has also been expanded. Woollen fabrics produced in 1956 amounted to 12 million metres. Tea-planting was extended to Tibet and other minority areas in 1952 where formerly the import of tea seeds was strictly forbidden. Egg products used to be a large export industry. In recent years fruits for Russia and canned food for SE. Asia have provided main items for

However, C.'s main effort is at present devoted to heavy industry. Whereas before 1914 she could hardly make any machine or vehicle, she is now exporting equipment for textile factories to Burma and Egypt, radio sets and electric equipment to SE. Asia, and making locomotives, ocean-going ships, and cutting and precision machines for her own use. Her first motor-car company, with a capacity of 30,000 cars and lorries per annum, went into production at the same time as her first jet plane was produced in 1956. The equipment for building up her heavy industry has come largely from Russia and E. European countries. This is clear from the fact that, since 1952, nearly 80 per cent of her foreign trade has been with Russia and her allies, and that her chief imported items from 1950 to 1955 were factory equipment for 245 factories, metal-cutting machines and lathes (20,693), petroleum and its products (4,850,000 tons), fertiliser (2,380,000 tons), tractors (12,000), and other things such as boring machines, cranes, locomotives, cars, steel plates, and non-ferrous metals. Her exports to Asian countries include air compressors, universal engine lathes, milking machines, drilling machines, self-raking reapers, chemical raw material, minerals, building materials, cotton yarn and cotton piece goods, silk and silk piece goods, and grains. C.'s heavy industry is located in 3 areas: the 'steel capital', Anshan in Liaoning is within easy reach of the machine-building centre in Shenyang (Mukden), the shipyards in Port Dairen, and the coal-mines in Fushun; the iron and steel complex in central C., the triple city Wuhan (Wuchang-Hankow-Hanyang) astride the R.s Yangtze and Han, is supplied with iron and coal from Tayeh and Pinghsiang and occupies the pivotal position of the country's communication system; the new steel city being built in Paotow in Inner Mongolia is connected by railways to Peking, Ulan Bator, Tatung, the coal-field, and Lanchow, the oil supply centre. In E. C. Shanghai has many shipyards and machinery factories apart from its light industry. In W. C. Chungking acquired some importance as an industrial city during the war and it is now rapidly developing into a steel and railway building supply centre. Tientsin in N. C. used to be a city of light industry, but, owing to its proximity to coal-mines in Tangshan and the new seaport in Taku, its heavy industry is growing steadily. With better distribution of heavy industry in central and W. C.,

light industry in recent years has spread to the interior. Most of the new textile mills have been built in Honan and Shensi, sugar factories have been built in Szechwan, Inner Mongolia, Heilungkiang, and Kuangtung, dairy plants in Inner Mongolia and Kansu, and fresh-water fisheries in Hupei and Kiangsi. The progress of C.'s essential industry is shown in the following table (electricity in million kwh., machines in thousands, others in million tons):

	1949	1952	1953	1954	1955	1956	1957
Electricity	4,310	7,260	9,200	11,000	12,100	14,900	19,030
Coal	30.98	63.53	66.57	79.92	93.17	108.97	122.44
Oil	.122	.463	.622	.789		1.40	2.01
Iron	.248	1.90	2.17	2.96	3.62	4.52	5.59
Steel	.158	1.35	1.77	2.23	2.85	4.516	5.24
Cement	.661	2.86	3.89	4.60	4.50	6.44	6.73
Cutting machines	—	16.30	24.00	23.50		27.36	
Ammonium	.027	.181	.226	.298			

Figures of other industrial output in 1956 were: aluminium ingots 20,000 tons; chemical fertilisers, 570,000 tons; metal-lurgical equipment, 8000 tons; power-generating equipment, 160,000 kw.; timber, 20 million cub. metres; salt, 7 million tons; edible vegetable oil, 1.7 million tons; sugar, 1.1 million tons; machine-made paper, 650,000 tons. In the above tables, 1949 and 1952 were respectively the year in which the present gov. came to power and the year before its first Five-Year Plan.

THE FIVE-YEAR PLAN. When the People's Gov. took over in 1949 after 8 years of war against the Japanese and a further 3 years of civil war, it found most of the factories, mines, and railways destroyed or dismantled and a legacy of mounting inflation bequeathed by the National Gov. There was, moreover, a famine in the Huai R. Valley in 1949, when the unification of S. and SW. C. was yet to be completed. In the next year the Korean War broke out with subsequent Chinese intervention. The recovery of her basic economy, however, was fairly rapid. Ever since Mar. 1950 commodity prices have been stabilised. By the end of 1952 most of the industries and railways were restored and some new ones built. The first Five-Year Plan was launched in 1953. It was planned that by 1957 production in heavy industry would be doubled as compared with 1952 and agric. production increased by 23.3 per cent. In heavy industry these aims were reached or surpassed by 1956, though some agric. products such as soya-beans, peanuts, rapo seed, and jute fell short of the planned output, while grains and other industrial crops just reached their set targets, and, as a result, such light industries as edible vegetable oil, cigarettes, and matches failed to fulfil the planned output. By 1957 it was estimated that ann. production in the essential industries would exceed by 15 per cent the target originally set in the plan. The 'breaking-

down' figures are: electricity, 19,000 million kwh.; steel, 5.2 million tons; coal, 122 million tons; metal-cutting machines, 30,000 units; power-generating equipment, 340,000 kw.; timber, 24 million cub. metres; cotton yarn, 5.6 million bales; marine and fresh-water products, 280.7 million tons; machine-made paper, 800,000 tons. Railways built in the 5 years amount to 3700 m. The total investment in the first Five-Year Plan is £11,004 million, of which 55.8 per cent is used in fundamental

construction; 44.2 per cent is used in designing, prospecting, stockpiling, transportation of material, repair, etc. The appropriations for the various depts of the fundamental construction are as follows: industry, £3601.4 million (58.2 per cent); communication, postal service, etc., £1189.8 million (19.2 per cent); agriculture, irrigation, and forestry, £472.4 million (7.6 per cent); culture, education, and public health, £446.2 million (7.2 per cent); public services in cities, £231.9 million (3.7 per cent); trading, bank reserve, etc., £185.5 million (3 per cent); others, £66.6 million (1.1 per cent). According to the plan, on the completion of the various industrial plants the ann. increase of the essential products will be as follows: iron, 5.75 million tons; steel, 6.1 million tons; electricity, 4 million kw.; coal, 93 million tons; metallurgical and mining equipment, 190,000 tons; power-generating equipment, 800,000 kw.; lorries, 90,000; tractors, 15,000; chemical fertilisers, 910,000 tons; cement, 3.6 million tons; spindles, 1.89 million; machine-made paper, 186,000 tons; machine-processed sugar, 560,000 tons. In the 5 years, 1953-7, students graduated from univs. numbered 283,000, of which 94,900 specialised in engineering and 59,000 in sciences; those graduated from technical schools numbered 888,300, of which 368,000 are trained in engineering and science. In addition, 920,000 technicians out of skilled workers were trained in schools set up in factories and plants. About 10,000 students were sent to Russia and E. European countries for advanced studies.

SOCIALISTIC ECONOMY. While the emphasis of the Five-Year Plan is on heavy industry, the whole plan is regarded as a blueprint of socialist reconstruction. In industry and commerce, all the new plants and dept. stores are estab. and owned by the state. Private owners of factories and shops were encouraged to join the socialistic economy. In so doing they would

allow the gov. to invest in, and thus expand, their business, and such factories and shops would be state-private jointly owned. The original shareholder of such an enterprise will receive from the gov. a guaranteed ann. dividend of $3\frac{1}{2}$ to 6 per cent, according to the nature of the enterprise, irrespective of gain or loss in the business. By June 1956, 98 per cent of the private industrial enterprises had come under state-private joint operation and 68 per cent of shops had been transformed into state-private shops. It has been claimed that retail trade in 1956 increased by 66.3 per cent as compared with 1952, and total value of exports and imports increased by 65 per cent. In agriculture the emphasis is laid on organising the individual peasants into producers' co-operative farms in order to increase production. This has been carried out in 3 stages. After the land reform (1949-51) in which land previously owned by landlords were distributed to the tillers, the peasants were encouraged to organise their mutual-aid teams in which they own their lands but pool their labour and tools. More production in the lands of the mutual-aid teams than in the individual farms further encouraged them to form their producers' co-ops, in which they pool their lands as well as labour and tools. In distributing the profit to the peasant, the co-op takes into account the size of his land, the tools or draught animals he contributed, and his own working days in the co-op. He can put half of his land into the co-op and work on the other half by himself in order to compare the profits between the halves. By this process 90 per cent of the country's peasant households joined the co-ops in 1956. The last stage and ultimate aim is collectivisation, in which the peasants waive their land ownership. Members of co-operative or collective farms are entitled to keep part of their land for vegetable gardens, poultry-keeping, or livestock breeding. In Aug. 1955 the gov. fixed a certain quota of the co-operatives' and individual peasants' produce to be bought by the state and sold to the cities, the remainder to be disposed of by the peasants themselves. Reclaimed lands are run as state farms for mechanised farming. There were in 1954 2415 state farms, of which 97 were mechanised, with a total area of 494,000 ac.

CURRENCY, MEASURES, ETC. The coinage of C. has varied considerably during the ages. At one time the sole official monetary unit was the copper cash, of which 1000 (or in practice 1220) equalled 1 *halkwan* (or customs) *tael*. The *tael* is not a coin, but a weight of silver, and its value fluctuates with the value of silver. In 1928 the Hong Kong *tael* was equal in value to 2s. 11 $\frac{1}{2}$ d. A convention treaty with Great Britain in 1902 pledged C. to inaugurate a standard national coinage. In 1908 an imperial decree was issued, which made the silver *tael* coin of 0.98 touch, weighing 1 treasure-scale *tael*, the unit. In 1910 this decree was cancelled, and a further edict estab. the silver dollar

of 0.90 touch, weighing 0.72 treasury-weight *tael*, as the new unit. In 1928 the National Gov. decided that the *tael* should cease to be current after July, when it was proposed to mint a new uniform dollar as legal tender. The foreign dollar has had a successful career in C., and the first Chinese dollar had appeared in 1889. In 1914 a republican dollar was coined, and in 1927 this was replaced by the Sun Yat-sen dollar. The *tael*, as the commercial unit of exchange, was abolished in 1933, and the unit of currency was the silver dollar, the rate of exchange being fixed as 1 dollar to 0.715 *tael*. In 1935 the gov. adopted a scheme of monetary and banking reforms, including the following provisions: the bank-notes issued by the Central Bank of C., the Bank of C., and the Bank of Communications to be full legal tender; no use of silver dollars or silver bullion for currency purposes to be permitted. In 1939 the Brit. Gov. announced its decision to assist in establishing a £10,000,000 Chinese exchange stabilisation fund. During the Sino-Jap. War the inflation was such that, whereas before the war £1 = 15 Chinese dollars, the exchange rate fixed by the Foreign Exchange Equalisation Fund Committee (which was set up on 17 Aug. 1947), as at the end of 1947, was C. N. \$225,000 = £1 and C. N. \$3,000 = U.S. \$1. By Aug. 1948 the paper money issued by Chiang Kai-shek's gov. was virtually worthless and a new currency, the so-called 'golden yuan' note (1 = U.S. \$4), was issued. This 'golden' currency collapsed in a fortnight, and when the Communist force captured Shanghai in April 1949 prices were inflated 6 million million times as compared with commodity prices in April 1937. The Communists in N. C. had their own currency, known as the people's currency (*Jen-min Piao*), which also suffered inflation when they took over Chiang's cities. Commodity prices were stabilised in Mar. 1950, and the rate of exchange since 1950 has been £1 = 6.9 yuan. The old prin. weight measures are the *liang* or *tael* (1 $\frac{1}{2}$ oz. *avoirdupois*), of which 16 make 1 *chin* or *catty* (1 $\frac{1}{2}$ lb. *avoirdupois*); 100 *chin* make 1 *tan* or *picul* = 133 $\frac{1}{2}$ lb. These measures are also used for liquids. Though, in C., standards of weights, measures, and lengths vary all over the country, generally speaking 2 kinds of standards, the old and the new, are in use. The old standard was formulated from a law promulgated in 1914, establishing a double system, the standard metric unit and that based on *ying tsao ch'ih*, or 'builder's foot,' for length, and on the *tael* or *liang* for weight. The law governing the new standard was promulgated in 1929 and was intended to be the legal standard of weights and measures throughout C. For convenience' sake and customary usage it also estab. a double system. One is the standard metric unit, which came into operation in the Chinese customs service in 1934. Kung Lee equals the millimetre; K. Fen, centimetre; K. Ts'un, decimetre; K. Ch'ih, metre; K. Chang, dekametre; K. Yin,

hectometre; K. Li, kilometre, which equals 2 Chinese Li. The other, which is temporary in character, is designed only for market use and is to be abolished as soon as the people grow accustomed to the new system. Other measures are: 1 mou = 0.1644 ac.; 1 tan = 100 chin = 0.9842 cwt.; 10 ta'un = 1 ch'ih = 1.0936 ft.; 1 li = 0.3107 m. Apart from the avoirdupois weight system and land measurement, all the Chinese measures are decimal.

FINANCE. Chinese gov. revenue in the past depended mainly on land tax paid in kind, part of which went to local govts., the rest being sent to Peking by canal. The amount of ann. tax varied with the farmers' output which was subject to the vagaries of nature from year to year.

The sources of the 1956 revenue were: state enterprises, 48.19 per cent; taxes, 47.02 per cent; state bonds and foreign loans, 2.5 per cent; other sources, 2.29 per cent. Items of expenditure were: economic reconstruction, 52 per cent (an increase of 33.45 per cent over the 1955 figure); defence, 19.78 per cent (a reduction of 5.52 per cent of the 1955 figure); cultural and educational services, 12.54 per cent; administration, 7.84 per cent; aid to foreign countries, 2.8 per cent; payments of state bonds and foreign loans, 2.47 per cent; general reserve, 2.57 per cent. The following table shows national production in various branches in million pounds (those figures in parentheses are consumer goods):

	1949	1952	1953	1954
Industry	£1,562 m. (£1,113 m.)	£3,914 m. (£2,359 m.)	£5,157 m. (£3,030 m.)	£6,017 m. (£3,468 m.)
Handicrafts	£469 m.	£1,061 m.	£1,322 m.	£1,516 m.
Agriculture	£4,724 m.	£7,013 m.	£7,233 m.	£7,472 m.
TOTAL	£6,755 m.	£11,988 m.	£13,712 m.	£15,005 m.

Such conditions made budget making impractical in imperial days. Since 1820 Chinese customs duties had under treaty obligations been set aside to pay foreign indemnities, foreign loans, and their interests, with the remainder going to the Treasury. Great Britain in 1930 agreed to return her share of the 1900 Boxer Indemnity, as from 1922, to the control of the Chinese Gov. for the construction of railways and for educational purposes. In the first rep. (1911-26) the country was divided up by local warlords, each of whom seized the land tax in his own area, and the Central Gov. had very little revenue apart from the remainder of the customs duties. In 1928 a Budget Committee was formed under the National Gov., but as the nation's wealth was continuously drained by civil wars and internal corruption, no budget was ever issued. In 1937-8 the revenue amounted to \$879 million (£1 = C. \$15) and expenditure amounted to \$950 million, of which military expenses occupied 39 per cent. With the estab. of the People's Gov. there have been issued budgets and final accounts every year since 1950. In the following table, from 1950 to 1957, are figures of final accounts; that of 1958 is the budget figure:

Year	Revenue	Expenditure
1950	£2943,000,000	£2985,000,000
1951	£1,878,000,000	£1,725,000,000
1952	£2,740,000,000	£2,363,000,000
1953	£3,500,000,000	£2,500,000,000
1954	£3,981,000,000	£3,615,000,000
1955	£4,399,000,000	£4,253,000,000
1956	£4,456,000,000	£4,602,000,000
1957	£4,400,000,000	£4,376,000,000
1958	£4,724,000,000	£4,724,000,000

CONSTITUTION. C. had a number of provisional constitutions drafted by successive govts. In the first half of this cent., but strictly speaking none has been approved by parliament or put into effect. The first draft constitution was pub. in 1906 by the Manchu court which was soon overthrown. The last was announced by the Nationalist Gov. in 1948 when two-thirds of the country was already under the Communist regime. From 1911 to 1927 C. was torn by civil wars, and there was no parliament that could claim to represent the whole country. During the Nationalist regime (1927-48) members of the legislative *yuan* were not elected, but appointed by Chiang Kai-shek. When the People's Liberation Army had occupied most provs. of C. in 1949, a People's Political Consultative Conference was formed in Sept. in Peking by deputies from the Communist party, the Revolutionary Committee of the Nationalist party (Kuomintang), the Democratic League, and 6 other smaller political parties. It was this conference, in fact dominated by the Communists and pro-Communists, which drew up a *Common Programme* to be observed by all parties, formed a coalition People's Gov. based on the *Common Programme*, elected the chairman and 6 vice-chairmen of the Central People's Gov., and declared C. to be the People's Rep. of C. This *Common Programme* served as a provisional constitution from 1949 until 1954, when election of deputies for the National People's Congress was completed and the congress held its first session to discuss the present *Constitution of the People's Rep. of C.*, which was passed on 20 Sept. 1954. This constitution of 106 articles stipulates that the power of the state lies in the whole

people, who are represented in the National People's Congress which meets once a year, and its 1220 deputies serve a term of 4 years before a new election takes place. If a deputy fails to represent the opinion of his constituency, the latter deposes him and replaces him by a new deputy to be elected according to legal procedure. The congress is invested with the power of amending the constitution, legislating laws and bills, of electing, approving the appointment of, and deposing the chairman and vice-chairman of the state, the ministers, and other gov. officials. The constitution protects the citizens' private property and their right to inherit private property; their freedom of speech, religious belief, public assembly, and association. Every citizen above the age of 18 is entitled to vote or be elected as a deputy, irrespective of his or her nationality (among the national minorities), racial origin, profession, social status, religious belief, educational level, amount of property, and duration of residence in his or her constituency. (The chairman of the state must be over 35.) No arrest may be made without the warrant of the People's Court.

The new constitution changes the Kuomintang system of 5 powers to the 3-power tradition: the National People's Assembly, the State Council, and the Supreme Court. The People's Political Consultative Conference, whose 670 members are elected from the various political groups, popular organisations, various vocations, and from among the intellectuals, serves as the Upper House which advises the gov. on state policies.

GOVERNMENT. Before the 1911 revolution C. had been an empire for 21 cents. The emperor appointed all ministers and governors of provs. and approved the appointment of prefects and magistrates. His unlimited power was sometimes restrained, not by any constitutional stipulations, but by the Confucian philosophy that he should obey the Mandate of Heaven which is manifested in the will of the people, and the Taoist philosophy that the less the gov. interferes with the people, the happier will the people be. If at times the people in the country enjoyed a large measure of autonomy, it was chiefly due to the sovereign's voluntary adherence to these 2 schools of thought. When the monarchy was overthrown in 1911, the rep. was not unified, and the local warlords were unscrupulous, caring neither for old principles nor modern political systems. From 1927 to 1948 C. was under the Kuomintang 'tutelage' regime, in effect a dictatorship under Chiang Kai-shek, which tolerated 'no factions within the [Nationalist] party, no parties outside it.' When the Communists came to power in 1949, they sponsored a coalition gov. with the participation of all parties, including the Kuomintang and non-party leaders. In the 1954 general election a number of non-Communist and non-party deputies were elected, and the present (1957) People's Gov. is virtually the same coalition as it was when first formed in 1949, with the

Communist party taking a leading part. Those holding ministerial posts in the gov. are members of the Chinese Communist party, the Kuomintang Revolutionary Committee, the Chinese Democratic League, the Democratic Construction Association, the Peasant-Workers' Democratic party, the Chiu-san Society (profs.) and lecturers' party, the Taiwan Democratic Autonomous League, and non-party intellectuals. As the National People's Congress only meets once a year, a Presidium of 79 and sev. Standing Committees (National Minority Committee, 84 deputies; Legislature Committee, 32; Budget Committee, 26) are elected to discharge duties during the adjournment of the congress. The State Council consists of the premier, 10 vice-premiers, 35 ministers, and 5 committees. In addition there are bureaux of Civil Aviation, Broadcasting, Handicrafts Management, Statistics, etc. The National Defence Council consists of the chairman, who is concurrently the chairman of the People's Rep., 15 vice-chairmen, and 81 members. At the prov. (or autonomous regional) and lower levels there are prov., city, and co. people's congresses to which the local govts. at various levels are responsible. In the provs., municipalities, and autonomous regions there are also People's Political Consultative Conferences formed by representatives of local political parties and popular organisations. In administration, the prov. is divided into dists., the number and size of the latter varying with the size and pop. of the former. Each dist. consists of a number of cos. (*hsien*), and the co. is in turn divided into *shiang*, each comprising sev. vills. The judicial system, which is in theory but not in practice independent from administration, consists of the People's Court and the Prosecution Court. They are in 3 grades: the Supreme People's Court and Prosecution Court, the Prov. People's Court and Prosecution Court, and the Co. People's Court and Prosecution Court. No death sentence may be passed without the approval of the Supreme People's Court. The national minorities are represented in the National People's Congress and their leaders are appointed ministers in the State Council and elected chairman and vice-chairmen in their autonomous regions. In the provs. where there are national minorities they are represented in the Prov. People's Congress and their leaders take part in the prov. gov. The area where they live is carved out for an autonomous dist. or autonomous co. to be governed by themselves. In an autonomous region, dist., or co. the official language is that of the national minority.

ARMY, NAVY, AND AIR FORCE. The Chinese under the Manchu rule were not allowed to raise troops and all cities were garrisoned by Manchu armies. When the Taiping rebellion broke out in the 1850's the Manchu armies in S. and Central C. were completely destroyed. A local Chinese militia in Hunan was organised to fight the rebels and eventually it developed into an army of

formidable strength which the Manchu gov. was forced to recognise. This 'Hunan Army,' the embryo of modern Chinese land forces, was later replaced by the Peiyang New Army. In 1923 Sun Yat-sen founded the Whampoa Military Academy in Kwangtung with Chiang Kai-shek as its principal. The cadets of the academy, many of them Communists, later formed the hard core of the National Revolutionary Army which defeated the warlords and so made possible the estab. of the Kuomintang Gov. When in May 1927 the grand purge in the Kuomintang was ordered by Chiang, Communists in all armies were liquidated with the exception of 1 army which, led by Chou En-lai and Ho Lung, revolted on 1 Aug. 1927 in Nanchang, Kiangsi, and became the first Chinese Red Army. It engaged in guerrilla wars against the gov. on the borders of Kiangsi, Fukien, and Hunan, and in 1934 started its 8300-m. march to Yen-an, Shensi. At the outbreak of the war with Japan in 1937, the Kuomintang Gov. forces were estimated to be about 1,600,000. The Communist Army in Yen-an was recognised by the Chiang gov. in 1937 as the 8th Route Army and was assigned the task of fighting the Japanese on the N.W. frontiers. By capturing arms from the enemy it had expanded to over 400,000 men by 1945 and by then occupied the greater part of Inner Mongolia and N. C. In the ensuing civil war in Manchuria, 1948, the People's Liberation Army, as it was then styled, destroyed 450,000 of Chiang's best troops and captured all their Amer. equipment. By 1950, when the civil war was over, it was claimed that 8,000,000 of Chiang's troops on the mainland had been destroyed, many of them in fact having crossed over to the Communist side. This figure is not reliable, however. The present size of the Chinese regular army is not known, but the gov. had announced the demobilisation of 4,500,000 up to 1956. The national service system introduced in 1954 requires the recruitment of 900,000 men at the age of 17 each year for a period of 2 years' training in the army, while those in the navy and air force are trained for 3 to 5 years. The first Chinese navy was almost completely destroyed in the 1895 Sino-Jap. War. In 1898 C. bought 5 destroyers, the largest of which, the *Hai Chi*, was 4300 tons. Further foreign purchase included 2 training-ships from Great Britain in 1911. On the invitation of the Chinese Gov. a Brit. naval mission was sent to C. in 1929 to organise the training of her fleet. As a result of the Jap. invasion C. lost most of her ships. After the war she received 2 destroyers from the Brit. Gov. and some destroyers and landing craft from the U.S.A. When Chiang was defeated in 1949 he took much of the navy with him to Taiwan. Before the war C. tried to organise an air force which later proved ineffective in fighting the Jap. invaders. From 1937 to 1940 some purchase of Russian craft was made, and from 1942 onwards U.S. craft were sent

to C. as part of the war-time lend-lease. The People's Liberation Army was at first a guerrilla force without any aircraft, but before and during the Korean War (1950-3) the Chinese rapidly built up an effective air force estimated to be 800 Mig-15 jet fighters. Its present strength, chiefly defensive in function, is estimated to be 2500 to 3000 Mig-15 and Mig-17 jet fighters; there is an unspecified number of bombers.

EDUCATION. A national system of education has been estab. in C. ever since Confucius (q.v.) founded the first academy at the beginning of the 5th cent. bc. The Imperial Academy in the cap. had been estab. since 136 bc, and schools in the provs. existed throughout the ages, while great families used to have their own clan schools. For the selection of civil servants, a system of state examination on all subjects, with emphasis on literature, hist., philosophy, and political economy, was introduced which lasted until 1905, with varying degrees of elaboration in different dynasties.

The first modern univ., the National Peking Univ., was founded in 1898; this was followed by the estab. of sev. technological institutes and teachers' colleges. Meanwhile students were sent abroad to learn modern social and natural sciences. In 1910 there were 30,000 students in Japan. In 1927, 5000 were in Japan, 2000 in the U.S.A., and 600 in Europe. The system of 6 years for primary schools, 6 years for high school, and 4 years for univ. education was copied from the U.S.A. by 'returned students.' In 1949 there were 24,400,000 pupils in primary schools, 1,268,000 in high schools, and 116,000 in univs. Since 1950 efforts have been made to reorganise and expand the existing univs. The missionary univs. in C. were taken over by the gov. in 1951 and were incorporated into some of the national univs. in 1952. There were in 1957 67,000,000 pupils in primary schools, 5,950,000 in high schools, 801,000 in technical schools, and 440,000 in univs. The Academia Sinica (Chinese Academy of Sciences) has increased from 17 in 1949 to 60 research institutes of natural and social sciences, including hist., archaeology, philology, etc., with sev. thousand research fellows. The Central Institute of Literature and History in Peking, where veteran scholars of the traditional school carry on their researches in classics, is the old Hanlin Academy in modern dress. Local scholars of the old school are assigned similar work in the Prov. Institute of Literature and Hist. in each prov. While higher education is the concern of the ministry, secondary education is financed by local govts. and trustee bodies. Both Russian and English are taught in schools as secondary languages. Mass education in the countryside, aiming at wiping out illiteracy, is conducted by agric. producers' co-operatives. For social education there are 2400 cultural institutes all over the country, one for each co., in addition to 93 public libraries, 46 museums, and 2190

theatres. Books printed in 1957 totalled 2400 million (1949: 100 million).

RELIGION. Three religions, Confucianism (if it may be called a religion), Buddhism, and Taoism, are officially recognised by the Chinese Gov. Confucianism is a moral system which definitely refuses intercourse with the unknown, and emphasises the duties of the present life. Confucius (K'ung Fu-tzu) encouraged ancestor worship as a part of filial piety, but he himself is not worshipped as a god. At the present time there is a reaction against his teachings, which uphold feudalism and the family, as being unprogressive. Confucianism makes for extreme courtesy. Taoism, taught by Lao-tzu, an older contemporary of Confucius in the 6th cent. BC, is a refreshing rationalistic philosophy. Later it degenerated into magic, concerned with the search for the elixir of life. Buddhism entered C. in the 1st cent. AD, and thence spread into Tibet, where in the form of Lamaism it now has its stronghold. Mohammedanism was introduced in the 7th cent. AD, and spread with such success that there are now 3,600,000 adherents of this faith in C. A large native literature has grown up around it. Christianity was introduced by the Nestorians in AD 635, but died out after flourishing for 2 cents. In 1247 the first Catholic missionary, Friar John of Carpini, entered C., and in 1581 the Jesuit Father Ricci made many converts. Prior to 1949, the Rom. Catholic faith had 1,250,000 adherents, while Protestantism had about 400,000. Christianity has suffered in the eyes of the Chinese owing to the variety of sects which used to have missionary H.Q. in C. The coming to power of the Chinese People's Rep. led to a widespread expulsion of foreign missionaries and church dignitaries, and the churches were taken over by native Chinese Christians. Most of the aboriginal hill tribes are still nature worshippers, and ethnically are distinct from the prevailing Mongoloid pop.

HISTORY. *Archaeological findings and early history.* The Chinese have their own traditions as to the hist. of the human race, and these show no signs of any migration. Auct legend has it that after the time of P'an-ku, the first man, there were 10 periods of sovereigns, to the reigns of whom most of the great advances in civilisation and culture are assigned. The first emperor of whom a detailed account is given is Fu-hsi, whose lifetime tradition fixes as 2852-2738 BC, but he is regarded by many as a supernatural and semi-human being. Following him, and forming with him the group known as the Three Emperors, come Sheng-nung and Huang-Ti, carrying the story down to the 24th cent. BC. Immediately following come Yao and Shun, who are regarded by popular Chinese hist. as types of perfect emperors. On their heads are heaped up piles of virtues, all, apparently, of late origin. In 2205 BC begins the Hsia dynasty, of which the first emperor, Yü, came to the throne as successor to Shun on account of his engineering ability. This dynasty is

supposed to continue till 1766 BC, when Chieh, the 18th emperor, a type of the bad king, was overthrown, and the Shang dynasty commenced. This started well with its first sovereign, Ch'eng-Tang, but gradually degenerated until it ended with the contemptible tyrant Chou-hsin in 1122 BC. Modern archaeology, however, has thrown much light on both the prehistorical background and the dawn-ing period of Chinese hist. The remains of the first inhab. in C., who belonged to a race known as the 'Peking Man' or *Sinanthropus pekinensis*, were discovered in 1927 at Choukow Tien, near Peking. The 'Peking Man' lived at the beginning or middle of the Pleistocene, i.e. of the order of 400,000 BC. He was more human than *Pithecanthropus erectus*, but earlier than 'Neanderthal Man.' In Manchuria all stages of culture, from Palaeolithic to Mesolithic and Neolithic, have been found; and Neolithic sites of painted pottery have been discovered in the whole range of the Yellow R. valley, stretching from Kansu to Shantung provs. There were settlements on these ancient sites from 4500 to 2000 BC, the later part of which roughly corresponds to the period of legendary rulers up to Yao, Shun, and Yü the Great. Evidence from excavations shows that they lived on agric. as well as pastoral economy and were acquainted with carpentry, textiles, and ceramics. Pictographic language is also found on pottery dated 5000 to 4500 BC. The inclusion in their diet of rice, a grain not thought to be indigenous to C., suggests a diffusion from SE. Asia. The discovery in 1900 of a language both pictographic and phonetic inscribed on oracle bones and tortoise-shells from the Shang dynasty has substantiated what is recorded in books written from the 5th to 2nd cents. BC. The bones and shells number 200,000 fragments and over 500 of them are in the Brit. Museum. The names of more than 30 Shang kings and their order of succession in the inscriptions prove that the Shang genealogy recorded in ancient Chinese hist. books is astonishingly accurate. Inscribed bronze ritual vessels and carved jades show high artistic attainment by the Shang. With eclipses recorded in the Shang inscriptions, the authenticity of their hist. can be verified by modern astronomy. The Shang dynasty was overthrown by Kings Wen and Wu of Chou. The period of the Chou dynasty forms one of the classical epochs of Chinese hist. King Wu, the first emperor, aided by his brother, Chou-kung, set to work to weld the disunited members of the country into a solid whole. In doing this he made use of a system which is basically feudal. Agriculture improved, everywhere great public works were constructed, the nomadic life came to an end, and the foundation of the political system was laid. Literature and the arts flourished during the whole Chou period. The emperor was regarded as the son of Heaven, and became the mediator whom the people revered as Heaven's representative, and who at the same time sacrificed and acted as high priest for

the nation. The outlines, at any rate, of the reigns of the 35 sovereigns of the Chou dynasty are correct, and it is probable that the details are also mostly trustworthy. One, at any rate, has been tested. The record is given of an eclipse which occurred in the reign of King Yu, and astronomers have calculated that the date given for this is perfectly accurate. The date of the eclipse, 29 Aug. 776 bc, is therefore generally considered as one of the definite historical points in Chinese hist. During the cent. immediately following, disintegration set in, and the kingdom fell into 5 states, the period being known as that of the Five Leaders. The fortunes of each state varied considerably year by year, but the state of Ch'in, on the W. border, generally remains the most prominent. This was followed by a period of still greater anarchy and internecine strife known as that of the Contending States. In the midst of this disordered time come the 3 great Chinese sages, within a cent. or two of each other.

Confucius, b. 551 bc, was one of the first historians of his country. It was he who united all the traditions of gov. and conduct handed down through the ages, and welded them into the system of morality which his country has preserved since. He lays particular emphasis on the centralisation of authority, that being a particular need of his age. The father has absolute authority over his family, and the emperor is the father of the State. Lao-tzu (Laocius) (q.v.) and Mencius also belong to this period. Another sage, Moti, who taught universal love, altruism, simple life, and pacifism, was a great rival of the Confucian school. Arts, sciences, philosophy, law, etc., flourished in every state, and the logicians in Shantung were treated by the King of Ch'i with ministerial honours. This was indeed the period of a 'hundred contending schools of thought' in which philosophers debated day and night. The Chou dynasty was now very weak, and the influence of Confucianism was not strong enough to secure unity. The king of Ch'in made war upon King Nancho and with him the Chou dynasty ended in 256 bc. For a time there was no emperor, but in 249 bc the Ch'in dynasty, from which the name of C. is derived, had its beginning. King Chuang-siang, the nominal founder of this dynasty, d. in 246 bc, and was succeeded by Shih Hwang-ti, the first of the 'universal emperors.' This emperor set himself to do away with the feudal system, and to do this he beheaded some hundreds of the scholars, among whose ranks the system found its chief supporters. To him is attributed the building of the Great Wall, and he is also said to have made many canals, etc. For many cents. the Chinese had been engaged in warfare with the Hsiung-nu, probably connected with the Huns, and Shih Hwang-ti led a successful expedition against this tribe, driving them into Mongolia. He also extended the empire southward as far as modern Kwangsi prov. On the failure of the Ch'in dynasty, war broke out between Liu Pang and Hsiang Yu, 2 leaders of

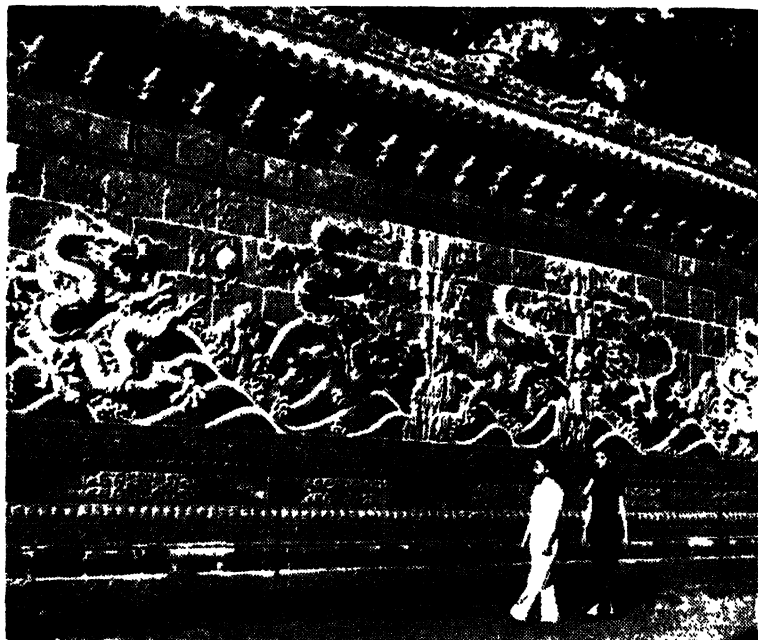
the successful rebellion which had brought this about, and the former prince came to the imperial throne under the title of Kao Ti (c. 206 bc). He was the founder of the Han dynasty.

The unified empire. The period of the Hans was one of great progress. Shih Hwang-ti, in his enmity against the literate classes, had ordered the destruction of all the books, except those on ordinary sciences and those in the public libraries, and an effort was made to repair the effects of this wholesale destruction. The system of competitive examinations, which lasted until the 19th cent., was now instituted. Except for successful campaigns with the Hsiung-nu, the empire remained at peace.

In the reign of Wu-ti (140-86 bc) the power of the Tartar marauders was broken, and E. Turkestan was made subject to the emperor. Many states on all sides were also absorbed, and the Han period ranks as one of the greatest epochs of Chinese national prosperity and expansion. To this dynasty, which ended in ad 220, succeeded an epoch of misrule and disturbance, that of the Three Kingdoms, which lasted for 45 years. Then the dynasty of the W. Chin was estab. by Szü-ma Yen, who took the title of Wu-ti. To this succeeded a chaotic period under the E. Chin, which family lost power in 419. This period is notable for the reception at the Chinese court of an embassy from the Rom. Empire, which was then sharing with the Chinese the menace of the Tartar hordes. Confucianism was now on the decline, and Taoism and Buddhism began to flourish in C., their combined force forming the new school of metaphysics. N. C. was then overrun by 5 races of Turkish origin who divided among themselves into 16 countries. For 200 years after 419 almost all trace of ordered gov. was lost. No less than 15 dynasties in N. and S. C. succeeded to the throne during this period. In 618 Li Yuan, taking the name of Kao-Tsu, made himself the first emperor of the great T'ang dynasty. The 300 years which followed, to its fall in 907, were years of great expansion and progress. At first the power of the Turks on the W. was so great that they had to be propitiated, but it was not long before aggressive measures could be taken, and the frontier was greatly extended in their direction as far as E. Persia and the Caspian Sea. From every part of Asia ambas. were received at the Chinese court. Later the frontier was also extended on the N. to the borders of Korea by the defeats inflicted on the Khitán. This was the period when poetry flourished greatly and poets were honoured as never before. It was also in this period that the able Empress Wu, the only lady sovereign in Chinese hist., ruled for 16 prosperous years (690-705). At the end of the 8th cent. the T'ang dynasty began to decline; that which succeeded it in 960, the Sung dynasty, was far greater in cultural achievement but less great in military prestige. Between these two (907-60) come 5 minor dynasties. This is, above

all, the period of C.'s literary activity. Book-making, printing, and the formation of libraries were actively carried on throughout the country. The chief adversaries of the empire during this period were the N. Khitan Tartars. The first 3 emperors, T'ai-tsu, T'ai-tsung, and Chien-tsung, carried on a campaign against them with gradually declining success, and the Chinese were finally compelled to call in

The war continued with Mongol victories until the death of Genghis in 1227. He was succeeded by his son, Ogdai, who made an alliance with the Sung of S. C. against the Chins. This alliance was successful, and the Chin dynasty was entirely swept away. Quarrels, however, then arose between the allies, and the Mongols swept over most of S. C. The whole of the country was in their hands when, in



New York Times Photos

THE KIULUNG OR NINE DRAGON WALL IN PEKING

This wall of coloured tiles was built during the Liao era (916-1125) by a member of the Liao dynasty from Jehol who seized the throne. The relief work in five bright colours shows nine dragons leaping energetically over waves to catch a bouncing ball. The dragon was the symbol of Chinese dynasts; the ball, the sun, signifying the reins of power.

the aid of the Nüchen Tartars to expel the Khitán from Liaotung. This the Nüchen did, but they then refused to leave the country they had thus occupied. They took the offensive against the Chinese and ultimately possessed themselves of the whole of N. C., over which they estab. the Chin dynasty, leaving only the S. half to the Sung. Meanwhile the power of the Mongols in E. Asia was increasing, and it was the N. kingdom that first felt the approach of the new danger. In alliance with the Khitán, Genghis Khan, the great Mongol leader, invaded Liaotung and captured the cap. city, Liaoyang, in 1212-13.

1259, Kublai Khan ascended the imperial throne. At no period did C. attain such greatness as now, under the Mongol dynasty. Its ters. extended from the Dnieper to the Pacific Ocean, and from the Arctic Ocean to the Straits of Malacca. Commerce flourished even with Europe, and it was during this period that Marco Polo, the first European to give the W. races an accurate idea of C., was in the service of the Great Khan. In 1368, when the Chinese leader Chu Yuan-Chang captured Peking, this great dynasty was succeeded by the native Ming dynasty, famous rather for the arts of peace than

for their conquests. They also strove to encourage intercourse with foreign nations, and many Portuguese and Sp. traders entered the country. The Chinese fleet, led by the eunuch, Adm. Cheng Ho, called on many countries in SE. Asia and went as far as Madagascar. Christianity was also introduced more extensively by the exertions of the Jesuit, Father Ricci. Canton became the chief port for foreign intercourse. But new foes, the Manchu Tartars, were now coming into prominence. In 1616 a force of these people, who had suffered much from Chinese oppression, entered the country and defeated the forces sent against them. In 1619 they took complete possession of Liaotung, and in the following year T'ien-ming, the Manchu king, declared himself independent. Meanwhile C. itself was in a state of disunion. There were various rebel forces, under different leaders, in arms against the gov. When the peasant leader Li Tzu-Cheng captured Peking the last emperor hanged himself. None knew where to turn for help, and the general on the Manchu frontier invited the Manchus to enter and subdue Li's peasant army. They did so, but refused to retire when their work was done. They took possession of the cap. without a struggle, and in 1644 the last dynasty of C., the Ta-Ch'ing, or 'Great Pure,' was estab. It is interesting to note that the pigtail, the plaited queue of hair worn at the back, so often considered a special mark of the Chinese, dates its introduction from this time. It was imposed on them by the Manchu conquerors, whose fashion of head-dress it was, and at first was received most unwillingly. Perhaps the greatest of the Manchu emperors was the second, K'ang-hsi (1662-1722), who is famous both for learning and for generalship. He devoted himself to study under the guidance of the Jesuits, and it is to him that the country owes the great dictionary of the Chinese language. His successor, Yung Cheng, was a monarch of a very different type, and it is from his reign that the policy of 'exclusion' clearly begins. He inaugurated a persecution of Christians, and did his best to undo the work which the Mongol emperors had started. The change was not, however, due to him alone. The conduct of Portuguese traders and the quarrels of the religious orders had not impressed the Chinese favourably. Moreover the ideas of civilisation entertained by the E. and W. races thus brought into contact were diametrically opposed on many points. Collision followed, as it was bound to do. From the 17th to the 19th cent. the attempt of C. to retire within herself and exclude the 'barbarians' marks her hist.

China's contact with the west. To Britain is due the opening of C. to Europe. Brit. trading with C. began in 1635, and for nearly 2 cents. the Brit. trade was in the hands of the E. India Co. The Chinese objected especially to the importation of opium, and the bringing in of this drug was made illegal in 1796. Mutual distrust between gov. and traders

had long been growing, and in 1837 the Chinese Gov. resolved on finally exterminating the opium trade. A governor, Lin, was sent to Canton, with orders to compel the merchants there to give up all the opium in their possession. The British were in a weak and precarious position, and the demand was complied with, but Elliott, the Brit. representative, refused to take the further step of signing a bond authorising the confiscation of all ships afterwards engaged in the trade. Negotiations continued for some time, which terminated with the Brit. Gov.'s declaration of war in 1840. The Brit. captured Chusan, stormed sev. cities, and finally threatened Nanking. A treaty was then made at the latter place by which 5 ports, Canton, Amoy, Foochow, Ningpo, and Shanghai, were opened to Brit. trade; Hong Kong was ceded to Britain, and a large war indemnity was paid. Various other questions were also settled, but not that of the opium trade.

In 1856 more complications arose, over the 'Arrow' affair, and a fresh war began. In this France joined, and after some victories by the allies the war closed in 1858 with the treaty of Tientsin. The Brit. then aided the Chinese to put down the famous Tai-ping rebellion. Till the end of the cent. the Chinese were engaged in resisting the encroachments of the Russians in Ill, of the Japanese in Formosa (Taiwan) and the Liukiu Is., and of the French in the S. Meanwhile Korea, nominally under the suzerainty of C., was threatening to prove the cause of a war with Japan, owing to the encroachments of the latter power, and in 1894 this actually came. After a year of conflict the Chinese signed a treaty at Chifu (1895), in which the independence of Korea was recognised by C., and Formosa and part of the Liukiu archipelago ceded to the conquerors. At this period many new treaty ports were opened to the W. powers, who aided the Chinese in return to eject the Japanese from Liaotung. C. then set to work vigorously to reorganise her military system. In 1897 Germany seized the port of Kiaochow, and in the following year C. granted the Germans a lease of this dist. for 99 years. In the same year (1898) Russia also received the lease of Port Arthur and its dist., while Britain received Weihaiwei, and a 90 years' lease of part of Kwantung. France received the lease for a similar time of the Bay of Kwangchow-wan and of the ls. near the bay. These predatory proceedings brought in their train a natural reaction against foreigners, a reaction which culminated in the Boxer rising (1900) (see BOXERS, THE). In Feb. 1904 Russia and Japan came into collision over the question of Korea, and in a series of engagements, all of which occurred in Manchuria, Korea, or on the Chinese seas, Russia was severely beaten (for details see RUSSIA). Throughout this war C. remained a passive spectator. The terms of the treaty of Portsmouth, U.S.A., which was signed on 29 Aug. 1905, in so far as they affected C., included the conveyance of the lease of Port

Arthur and Dairen (Dai) to Japan and the recognition by Russia of Korea and S. Manchuria as being within Japan's 'sphere of influence.' Korea was finally annexed to Japan on 23 Aug. 1910, and the annexation was not questioned by the powers. In estimating the factors which led up to the revolution of 1911-12 (perhaps the greatest revolution the world has yet seen if the number of people it affected be taken into account) the weakness of the Manchu court must be borne in mind. The ambitious but youthful emperor, Kwang-Hsü, attracted by the reform plan of the able and patriotic scholar, K'ang Yu-wei, made an attempt in 1898 to introduce administrative reforms. He was, however, betrayed by the traitor Yuan Shih-kai, Viceroy of Chih-li, and the 'reform' lasted only for a 100 days. It at once led to the reins of gov. being seized by his aunt, the reactionary and aged dowager empress, the emperor being made a prisoner in everything but name. Six of the reformist leaders, including K'ang's brother and a great philosopher, T'an Sun-t'ung, were beheaded on 28 Sept. in Peking. There is little doubt as to the complicity of the dowager empress in the Boxer rising, but even she was forced to make some concession to the forces of progress within the empire. Edicts were issued in which constitutional reforms were promised, such reforms to be effected gradually, the whole to be completed by 1917. On 14 Nov. 1908 the Emperor Kwang-Hsü *d.*, and strangely enough on the following day the dowager empress also *d.* The emperor, who had *d.* childless, was succeeded by his infant nephew, P'u-yi (b. 11 Feb. 1906), who was not quite 3 years of age, Prince Chun, his father, being appointed regent. Prince Chun was a man of enlightened character. Knowing too well the cause of the tragic failure and death of the former emperor, he promptly dismissed Yuan. The storm of revolution burst on 10 Oct. 1911, on the banks of the Yangtse, a dist. in which insurrections seem to be endemic. The rising in Hankow in the prov. of Hupeh was joined by the modern-drilled troops at Wuchang, near Hankow. The neighbouring arsenal of Hanyang was captured and with it funds to the extent of \$400,000.

The first republic. The movement, which was more anti-dynastic (i.e. anti-Manchu) than republican, rapidly spread, and soon embraced most of the S. provs. of C. The leader of the revolt at Hankow was the able general, Li Yuan-hung, but the inspirer of the revolution was Sun Yat-sen, at that moment in America. The distraught Manchu court on 14 Oct. sent for Yuan Shih-kai, who at first refused to come to its aid, but eventually did so on the court conferring on him dictatorial powers. He dispatched Adm. Sa Chen-ping up the Yangtse with a squadron of gunboats, and proceeded to quell the rebellion at the head of the still remaining loyal troops (mostly N.). On 13 Oct. the rebels proclaimed a rep. in the prov. of Hupeh, with Li Yuan-hung as president, and notified the foreign consuls

that the property and persons of foreigners would be respected. After some indecisive fighting around Hankow, in which the advantage lay first with the rebels and then with the imperialists (Hankow being recaptured and burned on 29 Oct.), a truce was arranged. In the meantime a rebel gov. was estab. at the old cap. of C., Nanking, and a convention representative of all the S. provs. was assembled first at Shanghai and later at Nanking. Sun Yat-sen duly arrived in C., and Yuan Shih-kai secured from the royal house in the closing days of 1911 an edict pledging itself to abide by the decision of a national convention as to whether it should abdicate or not. The revolutionaries now demanded that the Manchu dynasty should abdicate and a rep. be estab., but Yuan strove hard to bring about a constitutional monarchy only. He sent Tang Shao-yi to negotiate with Wu Ting-fang (formerly Chinese ambas. at Washington), and Tang was apparently won over to the republican point of view. On the other hand, Sun Yat-sen, who had been elected president of the rep. by the Nanking Convention, by an act of patriotic self-effacement which saved much bloodshed, refused to accept the position, and urged that Yuan Shih-kai be appointed. Seeing that this was exactly what he had been striving for some time, Yuan set himself to the task of making the change from the old regime to the new with as little damage as possible, and sought to procure some face-saving conditions for the retiring dynasty. On 12 Feb. 1912 the throne issued 3 edicts, in which it announced its will to abide by the decision of the National Convention and accept the rep., entrusting Yuan with the task of bringing about the new constitution in conjunction with the Nanking Gov., and, after exhorting all peaceably to accept the new order, announcing the abdication of the dynasty. A constitution of 70 clauses was promulgated; the emperor was to retain his title and receive a pension, and be accorded the civility due to a foreign sovereign. On 27 Feb. the Nanking Assembly endorsed this decision by electing Yuan as president, and he was formally installed on 10 Mar.; but for a long while there was a deadlock over the question whether Peking or Nanking should be the cap. of the rep., the question not being settled in favour of Peking until April. Tang Shao-yi, who subsequently resigned, was appointed premier, Li Yuan-hung vice-president, and a cabinet drawn from both govts. was constructed. The National Assembly met in Peking in April 1913, and censured Yuan Shih-kai for negotiating a foreign reorganisation loan. Foreign capital in C. had led to the system of extra-territoriality, granting of concessions, etc. Conflict between Yuan and Sun Yat-sen resulted in the second revolution in July. Sun fled to Japan, and on 6 Oct., under the guard of Yuan's own troops, the assembly 'elected' Yuan president for 5 years. His first act was to dissolve the Kuomintang and expel its members from Parliament. The Kuomintang originated with the youth

movement. In 1894 Sun founded the Shing Chung Hwei (C. Revival Society), which gained many supporters owing to the feeling aroused by the 'unequal treaties' contracted between the powers and the enfeebled Manchu Gov. In 1905 the society was reorganised, and in 1911 was called the Kuomintang (People's National party). From 1913 to 1916 the party showed no activity beyond secret propaganda against Yuan's monarchical ambitions. In 1914 the U.S.A. proposed an agreement to neutralise the Far E. Japan took exception and, following an ultimatum to Germany, attacked the Ger. leased ter. of Kiaochow and, on 7 Nov. 1914, captured Tsingtao. Japan also occupied Chinese dists. in Shantung, thus violating Chinese neutrality. Protests were met by the notorious twenty-one Demands, which meant the control of C. by Japan. An ultimatum forcing acceptance of these was delivered to C. on 7 May 1915. Yuan partly accepted Japan's demands on 9 May, on condition that the latter would recognise him as the Emperor of C., a position he had been working for from the time he betrayed Emperor Kwang-Hsu to the dowager empress. To this condition Japan readily agreed in secret, and in Aug. Yuan announced that people in many provs. had 'requested' that 'the republic be abolished' and that 'he should be the 'emperor,' which title he was ready to assume on 1 Jan. 1916. However, opponents of this scheme, led by Prof. Liang Chi-ch'ao and his disciple, Gen. Ts'ai E, rallied in Yunnan and revolution broke out there on 25 Dec. 1915. In 2 months half of the country joined the revolt and Yuan was forced to revoke his scheme and 'resumed' his presidency on 22 Mar. 1916. On 6 June he d. and Li Yuan-hung became president. In a dispute with the premier, Tuan Chi-jui, over C.'s participation in the First World War, Li called in Gen. Chang Hsun as mediator. Chang's first act was to dissolve Parliament, and many members left Peking to form a constitutional gov. at Canton under Sun Yat-sen. Tuan Chi-jui was still premier, and war was declared on Germany and Austria on 14 Aug. 1917. The revolutionary gov. at Canton also declared war. In Aug. 1918 the warlords or *tuchuns* assembled the 'bogus' Parliament and elected Hsu Shih-chang as president. At the Versailles peace conference C. was represented by delegates from both the Peking and Canton Govs. France and England were bound by secret treaty to support Japan's claims to the former Ger. ters., and Shantung was accordingly awarded to Japan by the Council of Three, 30 April 1919. Thereupon the Chinese delegates refused to sign the treaty of Versailles. When it was revealed that what Japan asked for in Paris was no more than part of her previous '21 demands,' secretly accepted by Yuan Shih-kai in exchange for Japan's recognition of Yuan's 'empire,' an anti-Jap. movement was launched by Peking students on 4 May. It rapidly spread all over the country, and all the

factories and shops in Shanghai, the biggest city in C., struck from 3 to 9 June. The gov. was forced to dismiss the minister of foreign affairs and 2 other junior ministers previously responsible for the negotiations with Japan. The students and their tutors realised, however, that C.'s backwardness was deep-rooted and that the whole pattern of Chinese feudal thought was an anachronism in the modern world. The student movement, known as the 'May 4th Movement,' then turned to questioning the value of the whole traditional pattern of Chinese thought and custom. The most remarkable achievement of this movement, however, was the reform of the education system. Hitherto the Chinese pupils from the univ. down to the primary school had been taught in every subject in the classical language of Confucius' times, and literacy in the country was extremely low. The exponents of the movement now advocated that the written language should be identical with the spoken language and that vernacular literature instead of Confucian Classics should be taught in primary and secondary schools. Within a year over 400 newspapers and magazines changed their style from the classical language to the vernacular, and since then a huge amount of literature, including short stories, novels, plays, and poetry, has been produced in the vernacular. At the same time a phonetic script was devised with a view to changing in the future the ideographic Chinese characters into an alphabetic language. The movement was hailed with some justification as the 'Chinese Renaissance,' for it is through the official adoption of the vernacular as the standard national language that mass education has been made possible. On the political side, it was in this movement that some young intellectuals, among whom was Mao Tse-tung, started the pioneer work of organising, first a Marxism Study Group, and then the Chinese Communist party (1921), which was soon destined to lead the entire nation on to a totally different road.

Meanwhile in April (1919) the Canton Gov. had split, and Sun Yat-sen with 2 other leaders from Shanghai negotiated with Tuan Chi-jui at Peking for the unification of the country. In 1921 Sun Yat-sen returned to Canton, and in April was elected president.

On 11 Nov. 1921 the Washington Conference met to discuss the limitation of armaments and incidentally the question of Shantung and the Far E. A compromise was reached over the management of the Shantung Railway, and it was agreed to restore to C. all public property in Tsingtao. By 1923 C. was in possession of all former leased ters. at Kiaochow. Other Chinese demands for tariff autonomy and the abolition of extra-territoriality were favourably received. Britain proposed to restore Weihaiwei, and the agreement was eventually signed on 18 April 1930. A commission, empowered at Washington to investigate

extra-territoriality, suggested in their report (1926) a progressive scheme for the elimination of foreign jurisdiction in C. In 1929 an exchange of notes took place between the Nationalist Gov. of C. and the interested powers concerning extra-territoriality. In April 1922 Sun Yat-sen, president of the Canton Gov., and Chang Tso-lin, dictator in Peking, made an alliance to suppress Wu Pei-fu. Wu, aided by the 'Christian' general, Feng Yu-hsiang, defeated Chang and, forcing Hsu Shih-chang to retire, reinstated the former president, Li Yuan-hung. At this time Russia tried to restore diplomatic relations with C., but Joffe, the Soviet envoy, agreed to mutual co-operation with Sun Yat-sen. Sun was in exile at Shanghai owing to conflict between the Kuomintang and the Kwangsi military party, but on 21 Feb. 1923 he returned to Canton and formed a military gov. The constitutional Parliament, however, in force in Peking should have had Sun's co-operation. Karakhan, who was in Peking in Sept., restored relations between Russia and C., relinquishing all Russian extra-territorial rights. Sun reorganised the Kuomintang, and at the first national congress, held in Jan. 1924, issued the celebrated manifesto which became the foundation of the National Gov. Sun had based his constitution on that of Great Britain and the U.S.A., hoping for their support, but after the Hong Kong strike in 1922 none was forthcoming, and in 1924 he turned to Russia. Borodin came to Canton as Soviet representative. The Kuomintang was a revolutionary, not a Communist, party, but after the 1924 reorganisation members of the Chinese Communist party were admitted. The Chinese Communist party, beginning as a secret society in 1920, consisting of students and intellectuals, intensely idealistic, had grown rapidly. In Nov. Chang Tso-lin and Feng Yu-hsiang persuaded Tuan Chi-jui to return to Peking as chief executive. Sun was invited to a conference, but arrived in Peking a sick man. On 12 Mar. 1925 he d., and his death caused a split in the Kuomintang. Meanwhile a Nationalist army had been formed by Chiang Kai-shek, head of the Whampoa Military Academy. Forty Russian instructors, ex-officers of the Red Army, had been engaged by Sun to teach in the academy. Borodin continued as adviser to the Central Executive Committee of the Kuomintang, but during his absence in Mar. 1926 Chiang succeeded in expelling the Russians and other Communists, including Wang Ching-wei, from Canton. On Borodin's return in April, however, Chiang drove his anti-Communist colleagues from office. On 11 June he became commander-in-chief of the Nationalist Army, and began his campaign against the N. By July Changsha was taken, and by Aug. the borders of Hupeh were reached. The N. warlords, Sun Chuan-fang and Wu Pei-fu, failed to unite, owing to jealousy, and Wu was defeated. Hankow was captured. On 6 Dec. the Nationalist Gov. arrived there

from Canton. The Communist party was still predominant, with Borodin as advisor, but the most outstanding man was Eugene Chen, the minister of foreign affairs, a man held in respect by all parties. Chiang Kai-shek, after the defeat of Sun Chuan-fang, estab. a rival gov. at Nanchang. The march of the Nationalist armies had been prepared by propaganda, and on 3 Jan. 1927 anti-foreign feeling culminated in the attempt to seize the Brit. concession at Hankow. The concession was defended by marines, but no shot was fired and no lives were lost. Negotiations followed between Eugene Chen and O'Malley, the Brit. representative. The Brit. Gov. had adopted a new conciliatory policy towards C., and it was proposed to put the concessions at Hankow and Kfukiang under Chinese administration. Negotiations went forward favourably, but on 24 Jan. a Brit. expeditionary force of 20,000 men, with tanks, aeroplanes, and artillery, arrived in Shanghai. Shanghai was in danger from the fighting between Chiang and Sun Chuan-fang, but this precautionary measure to protect Brit. nationals so exasperated the Chinese that Eugene Chen broke off negotiations. They were resumed later, and on 19 Feb. the Chen-O'Malley agreement was signed. The S. armies took Shanghai on 22 Mar., and 2 days later entered Nanking. Although Chiang's armies had a reputation for orderly behaviour, a body of armed men began systematic looting of foreigners' houses. Seven foreigners were shot, and others, including the Brit. consul-general, were wounded. A party of 150 were eventually rescued under cover of a barrage from Brit. and Amer. warships. These Nanking outrages were the result of a Communist plot to discredit Chiang Kai-shek with the foreign powers. Chiang referred the powers to Nanking for their indemnities, and on 15 April himself ordered a clean-up of Communists in Canton with 2000 arrests and many executions. Previous to this the Hankow Gov. had tried to undermine his command in the army, and Chiang set up the rival Nanking Gov. He started the so-called purification movement and prosecuted the trade unions of Shanghai, with whose aid he had taken that city. In Peking Chang Tso-lin, who had maintained his authority since 1926, also started a Communist prosecution. The Hankow Gov. then began a military drive northward, hoping to take Peking in 3 months with the help of Feng Yu-hsiang, who had declared for the Nationalist cause. Tang Sheng-chih began the march against Peking on 22 April, hoping to join with Feng, who was in Shensi with the Kuo-min Chun or Nationalist Army, drilled with the fanaticism of a Cromwell. Hankow was itself beset by a Nationalist general of Chiang Kai-shek's faction. The gov. would have fallen had not its troops gained a victory at Chumatién and taken Cheng-chow. Feng controlled Honan, while Tang returned to defend Hankow. The severe losses at Chumatién, however, indefinitely delayed the attack on Peking. Meanwhile Chiang was

conducting his own campaign against Peking, and in June invaded Shantung. Fifteen hundred Jap. troops suddenly occupied Tsinanfu, and Tsingtao was similarly garrisoned. The pretext was the protection of nationals, but Japan was interested in maintaining the supremacy of Chang Tso-lin. Hankow had declared war on Nanking on 9 July. Chiang was hemmed in on 3 fronts, as Feng, who had been keeping the balance between Nanking and Hankow, joined with Hankow. However, the difference between the 2 govs. was beginning to disappear. Members of the Kuomintang at Hankow became dissatisfied, as it appeared that Borodin was pledged to betray the gov. into a more violently communistic regime, presided over by the Chinese Communist party. On 17 July Ho Chien, a Nationalist general, taking advantage of the Hankow forces being engaged with Nanking, descended on Hankow and effected a *coup d'état*. Eugene Chen was expelled, and later left C. for Moscow. There was a general exodus of Chinese and Russian Communists. Mme Sun publicly proclaimed at Moscow that Sun Yat-sen's work was betrayed into the hands of the militarists, and that the revolution was finished. The only obstacle now hindering the reunion of Hankow and Nanking was the person of Chiang Kai-shek, and he resigned on 12 Aug. 1927. Nationalist control was estab. S. of the Yangtse, and in Sept. the Nanking Gov. was organised by the reunited Kuomintang. Nanking became cap., having no foreign concessions and being near Shanghai. The gov. in renouncing the workers' and peasants' associations looked to the Shanghai bankers for support. In Jan. 1928 the Nanking Gov. again offered Chiang the command of the army and the leadership of the revolution. He tried to stabilise the gov. in order to continue the N. campaign, and on 7 Jan. 1928 the Third Nanking Gov. was organised. Its manifesto was based on Sun's Three People's Principles, but all connection with Soviet Russia was severed. T. V. Soong was appointed minister of finance. He had the confidence of the Shanghai bankers, and a loan was floated to subsidise the N. campaign. In Mar. the expedition started. Chiang was allied with Feng Yu-hsiang and Yen Hsi-shan, and the common enemy, Chang Tso-lin, was routed. The Japanese again rushed troops to Tsinanfu. Chiang's advance was checked, and skirmishes between Japanese and Chinese were inevitable, but more serious consequences were avoided by Chiang's prudence. The implication that Chang Tso-lin was being indirectly aided by Japan broke the morale of the N. resistance. Chang evacuated Peking, and, while *en route* for Manchuria, was blown up and killed.

Under the Kuomintang tutelage. The party dictatorship of the Kuomintang inaugurated the period of political tutelage which was to succeed militarism. At the fifth plenary session the Organic Law of the National Gov. was drawn up. This was the basis of the ensuing

Five-Power Gov. The chief problem confronting the National Gov. was now a military one, which in its financial aspect meant a burden of taxation. Chiang wished to create a strong national army out of the existing troops, and to disband and industrialise the remainder. He sought the help and personal advice of Bauer, a Ger. colonel; this man earned Chiang the jealousy of other commanders, notably Feng, who issued manifestoes criticising the gov. and ridiculing his colleagues. Chang Hsueh-liang, governor of Manchuria, acceded to the central authority, and this gave Chiang the opportunity to call a disbandment conference in Jan. 1929. He met with no support, and the failure of disbandment brought renewed civil war. In Feb. Feng left Nanking to join his army, wishing to control Shantung as soon as the Japanese evacuated. At the same time the Kwangsi party, the Fourth Army group at Hankow, became disaffected towards Chiang, and made war on Nanking. Feng failed to co-operate, and Chiang's alertness destroyed the Kwangsi forces. Chiang had made overtures to Feng, promising him Shantung, but at the conclusion of the Wuhan or Hankow campaign the Nationalist control of Shantung proceeded. Feng was now openly hostile to Chiang, who, in asserting the authority of Nanking, was virtually dictator. In Mar. the Kuomintang convened the Third Party Congress, but although it strengthened the administration of the gov., it failed to find a sound financial policy. In the N. dissatisfaction with the gov. was aggravated by famine. Meanwhile in Manchuria trouble was developing over a dispute which began in July when the Russian manager of the Chinese E. Railway was dismissed by the Chinese, following a police raid on the Soviet consulate. A state of war existed for some months, until on 22 Dec. the Chinese acceded to the Russian demand for a restoration of the *status quo ante*. While the Manchurian trouble was at its height, Chiang was forced to compound with Feng, who retired, leaving the Nationalist forces to occupy Loyang. The year closed with a mandate issued by the Nanking Gov., abolishing extra-territoriality as from 1 Jan. 1930. In the N. the hegemony of Nanking was resented, and in Mar. Yen Hsi-shan allied himself with Feng and seized control of Peiping (Peking). Wang Ching-wei, the left wing advocate of reform, was expelled from the Kuomintang. In May civil war broke out between the N. and S. and in July resulted in a stalemate.

Events in China in the decade before the Second World War. Chang, ostensibly neutral, was eventually bribed by Chiang Kai-shek and marched his troops from Manchuria to Tientsin, thereby threatening the rear of the Yen-Feng forces, but leaving Manchuria ungaurded. He further seized the occasion to extend his gains southward to the Yellow R. Chiang Kai-shek, whose occupation of Hopei and Shansi had enabled him to defeat the coalition leaders, found it expedient to

acquiesce in Chang's usurpations and indeed to entrust him with the pacification of the country N. of the Yellow R. When Chiang was directing the civil war in the field, the Nanking Gov. was entrusted to Hu Han-min, the president of the Legislative Yuan, to whom Chiang was a junior member in the Kuomintang. After Chiang had won the war, the first thing he did on his return to Nanking was to imprison Hu. The Kuomintang was again split, and a SW. gov. was formed in Canton. But in 1931 came the Jap. military offensive in Manchuria, an event which prompted an overwhelming wave of nationalism, compelling the resignation of Chiang Kai-shek. His political difficulties had been aggravated by the Communists. However, Chiang Kai-shek retained his military power by means of alliances with loyal generals of sov. provs., while effective authority in the coalition gov. was vested in Sun Fo, only son of Sun Yat-sen, who became head of the Executive Yuan, a post comparable to that of Prime Minister, the foreign minister being Eugene Chen. In this way some semblance of national solidarity against foreign aggression was brought about, though, as later years showed, it was far from effective.

The Sino-Jap. War of 1931-3 apparently arose out of disputes over Jap. interests in the Manchurian Railway and, later, in the Shanghai area. Having overrun Manchuria in the autumn of 1931, the Japanese disembarked troops in the Shanghai area, alleging that there had been an organised Chinese boycott of Jap. imports. The League of Nations and the Amer. and Brit. Govs. tried to stop the conflict by reminding Japan of her obligations under the Nine Power Treaty of 1922. This treaty guaranteed Chinese sovereignty over Manchuria and the 'open door' for international trade. Japan was a signatory of this treaty, but she also had treaty rights over certain areas, which included that of maintaining garrisons in a defined railway zone. There was severe fighting early in 1932 in the Shanghai area. The Nanking forts were also fired on and a great attack launched at Chapel, while Jap. destroyers bombarded Woosung. In reply to the League of Nations, the Jap. Gov. refused to recognise C. as an organised people in the sense of the League Covenant, but averred that Japan had no territorial or political aspirations in C. Negotiations for an armistice, however, broke down. A puppet state called Manchukuo was set up under Jap. control. C. ineffectually protesting against its estab. as a breach of her sovereignty. Then the Brit. and Amer. Govs. made a joint proposal for the cessation of hostilities, which Japan accepted, while rejecting the offices of neutrals in the settlement of the Manchurian dispute. A League commission under Lord Lytton went out, however, to Manchuria to investigate the position, and issued a report suggesting the creation of a special regime there which would maintain the sovereignty of C. while safeguarding Jap. rights.

But in spite of an overwhelming vote of the League in favour of the report, Japan rejected it, holding herself to be the chief power responsible for keeping peace in the Far E. She then resumed the struggle, which ended, so far as this phase of Sino-Jap. relations was concerned, by Japan placing Pu-yi, ex-Emperor of C., on the throne of Manchukuo.

By the close of 1932 a large Chinese army under Chang Hsueh-liang, the young Manchurian warlord, was concentrated in Jehol to repel the further advance of the Japanese from Manchuria. But Jehol soon fell, and by May 1933 the Jap. armies had crossed the Great Wall and were standing outside Peking. An armistice was now signed creating a demilitarised zone, and a political council was formed at Peking with delegated authority from the Executive Yuan to negotiate with the Japanese for the restoration of the public services. In other parts of the country, however, there was much internecine strife. Disaffected elements from the Nineteenth Route Army, which fought the Japanese in Shanghai, were endeavouring to form a provisional gov. in Fukien with Eugene Chen as foreign secretary. Large Communist forces had begun a bitter struggle in Kiangsi, and, before all other factions had combined to repel them, had even menaced Amoy. But early in 1934 the Gov. forces regained their initiative and the Communist forces began their long march to NW. C.

Although an armistice had been signed with Japan, later events were to show that that power was very far from staying her hand in C. The salient feature in the hist. of C. in the 25 years before the Second World War was the gradual development of Jap. influence, and each step in the consolidation of that influence only marked the culmination of a policy which was initiated as long previously as 1915, when Japan, taking advantage of favouring circumstances during the First World War, presented some 21 demands on C., acceptance of which would have reduced the country to the status of a Jap. protectorate. Their partial acceptance, however, gave Japan a strong hold in N. C., especially in Manchuria. After the First World War Jap. policy seemed to grow more conciliatory, and by the Nine Power Treaty, signed in Washington, Japan pledged herself to respect the sovereignty and territorial integrity of C., and even to seek no exclusive privileges there. The growth of Chinese nationalism, however, soon gave rise to friction with Japan. After the occupation of Peking by the Nationalist armies, the autonomous gov. of Manchuria began to look to Nanking rather than to Tokyo for advice and tried to undermine the position of the Japanese as lessees of the S. Manchurian Railway, and it was this that led directly to the Sino-Jap. War of 1931-3 (described above) and the eventual estab. of the puppet state of Manchukuo. The Jap. armies actually marched on Peking in 1933, but the city was saved by an armistice

known as the Tangku truce, by which the Nanking Gov. agreed to prevent all anti-Jap. activities in N. C. The next significant event in C. was the pseudo-secessionist movement of the N. provs.—Suiyuan, Shantung, Hopei, Honan, Chahar, and others. This movement was ostensibly a Chinese revolt against an oppressive gov. led by Chinese generals, and it might have been regarded as a natural movement of reaction against Communist or Bolshevik influences but for the cloven hoof of Jap. 'co-operation' in the movement at the time of its announcement.

The Sino-Japanese War. Utter lack of political cohesion characterised C. in 1935-6. The Nanking Gov., under the leadership of Chiang Kai-shek, claimed to be the lawful Chinese gov. to speak for all C. But, although it was unquestionably the Central Gov. *de facto*, its political influence was by no means commensurate with the geographical area of the country. In the N. Manchukuo and Jehol, as well as those provs. under the control of the Hopei-Chahar Political Council, passed virtually under Jap. control. Outer Mongolia adopted a Soviet form of gov., and seemed, politically speaking, to be regarded to all intents as a protégé of the U.S.S.R. 'Communist China,' in addition, comprised many areas in the interior and in Fukien, and their presence inspired a series of military operations against them on the part of the Nanking Gov. with varying degrees of success. In the S. the SW. Political Council—the so-called Canton Gov.—was for some time practically independent of Nanking, and it was only after July 1936 that the Central Gov. estab. any considerable measure of control in the S. provs. It was from those provs., and especially from Kwangtung and Kwangsi, that the greatest opposition to Jap. penetration and other foreign penetration had come. Sino-Jap. tension grew acute at the end of 1936, when a delegation of students of the univs. of N. C. pressed the Nanking Gov. to adopt a strong anti-Jap. policy. They demanded an alliance between the Kuomintang, Chiang Kai-shek's Nationalist party, the Communists, and all other organisations in resisting Jap. aggression. Meanwhile the Communists, after their famous long march from Kiangsi to Shensi in 1934-5, had settled down in Yenan and were on friendly terms with Gen. Chang Hsueh-liang's troops whom Chiang Kai-shek had sent to Sian to suppress the Communists. Early in Dec. Chiang flew to Sian to press the unwilling young general to action against the Communists, but Chiang was kidnapped and imprisoned by Chang Hsueh-liang on 12 Dec. Anxious to form a united front against Jap. invasion, Chou En-lai, a Communist leader, intervened and secured the release of Chiang Kai-shek on condition that Chiang promised to stop civil war and to co-operate with all parties in face of foreign invasion. This co-operation between the Kuomintang and the Communists greatly alarmed the Japanese, and tension with Japan

became acute in July 1937 with the outbreak of fighting between Chinese and Jap. troops at Lukouchiao, SW. of Peking, on the 7th. On 13 Aug. war broke out in Shanghai, and the unabashed invasion of further areas of C., without any declaration of war, began. On 25 Aug. C. secured a Russian loan to the value of U.S. \$500,000,000, and, with the support of Communists in N. C., Gen. Chiang was prepared for a protracted war against the Jap. aggression. The Communist troops were organised into the Eighth Route Army in N. C. and the New Fourth Route Army in the Yangtse valley. At the close of 1 year (July 1938) the Jap. armies were in control of most of E. C.—300,000 sq. m., with an estimated pop. of 130,000,000—after more than 1,000,000 Chinese and Jap. lives had been lost and the greatest misery suffered by the Chinese civilian pop. Probably the Chinese casualties were over 400,000 soldiers killed and twice as many wounded, while the Japanese had 100,000 killed and as many wounded. The total number of refugees was not fewer than 10,000,000, but the final toll of the war in famine, flood, and disease is not known. In the middle of 1938 Jap. armies of 1,000,000 were mobilised against 2,000,000 Chinese on fronts 1500 m. long, spread over an area more than half the size of Europe. Neither country showed any sign of yielding. The results of the campaign in the first year of the conflict showed that Japan had obtained nominal control over all the ter. bounded by a line running from Hangchow through Wuhu along the Yangtse to Hukow, N.-eastward to the flood area, and all the country bounded by the bend of the Yellow R. northward into Inner Mongolia. They also controlled nearly the whole of N. C., the provs. of Shantung, Shansi, Hopei, Kiangsu, parts of Honan and Anhwei being also in their occupation. Peking and Tientsin were entered almost immediately after the outbreak of the conflict, and in the former city a Jap.-created provisional gov. was inaugurated. Further S. the Japanese captured Shanghai after a prolonged resistance, and, following a rapid advance inland, stormed Nanking, the Nationalist cap. (Dec. 1937). The National Chinese seat of gov. had previously moved to Chungking (Szechwan), far in the interior, but the conduct of operations continued to be directed from Hankow by Chiang Kai-shek. As at Peking, a Jap.-sponsored puppet gov. was estab. at Nanking. It was early evident that Japan's mechanised troops and modern equipment altogether outweighed the numerically superior masses of Chinese troops, whose lack of tanks, aeroplanes, and heavy mobile artillery found but little compensation in tenacity and bravery. But quantities of arms were constantly finding their way into C., particularly from the Soviet Gov., via Kansu, over the frontier from Fr. Indo-C., and via Hong Kong. Necessarily the conflict had repercussions on those countries which had commercial and business interests in the Far E. Moreover the Jap. press began to

criticise Britain on account of the arms traffic through Hong Kong; there were incidents at Shanghai, and the wounding of the Brit. ambas. in Aug. 1937 by machine-gun fire during a Jap. air reconnaissance led to a temporary deterioration of Anglo-Jap. relations. There was also some tension between Japan and the U.S.A., particularly after the sinking of the Amer. gunboat *Panay* on the Yangtse (Dec. 1937). With Germany and Italy, Japan's partners in the Anti-Comintern Pact (q.v.), however, Japan's relations continued to be cordial. At the end of June 1938 Japan stated that she proposed to occupy Hainan, the large is. near Fr. Indo-C., but the prompt action of the Fr. Gov. in occupying the Paracel Is., a series of coral reefs to the SE. of Hainan, coupled with a warning from the Brit. Gov., deterred Japan from carrying out her intention.

By the end of the second year of the conflict neither C. nor Japan was within sight of ultimate victory, and both countries recognised that the struggle would be prolonged indefinitely. Both govts. announced their determination to pursue the conflict to a victorious close. In the autumn of 1938 the Japanese pursued a vigorous drive up the Yangtse, and they soon occupied Kiukiang. In Oct. they captured Hankow and Canton. In Feb. 1939 the Japanese descended on the is. of Hainan, a move which caused uneasiness to the Fr. Gov. but led to no action by them. In the spring of 1939 there was a resumption of military activity with the launching of a Chinese offensive on all fronts; but apart from local successes in central C. and near Canton, the military situation was little altered. Later (May) the Japanese intensified their grip on the Chinese coast by landing at the international settlement of Kulsang (off Amoy), and by occupying Swatow (June). In N. and central C. and in the Canton area the Chinese Communist Eighth Route Army, the New Fourth Army, and Pearl River columns carried on a well-organised guerrilla warfare with considerable success. The general position then was that while the Japanese nominally controlled vast areas of C., their actual control was limited to key cities, ports, waterways, and railways, while outside the main lines of communication they had little or no hold on the countryside. But, necessarily, the effective control of the coast, especially after the fall of Canton, made it practically impossible for C. to import war materials by sea, and in 1940 her main arteries of communication with the outside world were the 'back doors'—the long caravan route from Lanchow (Kansu) in the NW. to Asiatic Russia, and the new road linking Kunming (Yunnan) with Burma. This remarkable piece of road construction was completed in Dec. 1938 in spite of the greatest difficulties.

In the occupied areas the Jap. Gov. made strong efforts to exploit the economic resources of the country, and in 1938 a 'China Board' was formed in Tokyo for

this purpose, and, later, development companies were formed with Jap. capital. A Supreme Council of N. C. was formed about the same time, in which were incorporated the Jap.-controlled Nanking and Peking provisional govts.

Considerable friction developed in 1938–1939 between Japan and the W. powers, and protests were made by the Amer., Brit., and Fr. Govs. at the closing of the Yangtse to foreign shipping, a step which was contrary to the 'open door' policy which the W. powers had consistently upheld in C. The grant of an Amer. credit of \$25,000,000 to C. for the purchase of Amer. manufs. and primary produce also strained Jap.-Amer. relations, while the action of the Brit. Gov. in 1939, in deciding to assist C. by the creation of a £10,000,000 exchange stabilisation fund (see CURRENCY, etc., above), evoked bitter protest from Japan. Tension also grew with France over the occupation of Hainan and the annexation of the Spratley Is., a small group in the S. C. Sea, sovereignty over which was claimed by France. Tension grew still more acute with the Jap. landing at Kulsang, the occupation of Swatow, and the blockade of the Brit. and Fr. concessions at Tientsin, with the consequent infliction of humiliations on Brit. subjects by Jap. soldiers.

China in the Second World War. C. was rapidly changing before the Second World War. In the decade 1928–37 the W.-trained Chinese had their opportunity to secure administrative control within C. and to modernise the country. In this same decade C.'s heavy and light industries expanded with rapidity, and in all kinds of enterprises which had formerly been possible only under foreign ownership or management the Chinese manifested ever more enterprise and competence. The National Gov. also showed skill in dealing with foreign countries, whose conservative interests were calculated to resent any attempt by the Chinese Gov. to compel them to respect the national interests of C. The primary problem was the old desire of the foreign interests for a strong man to rule C. on their behalf, and they naturally favoured the idea of making Chiang Kai-shek their strong man. But Chiang Kai-shek gradually succeeded in committing America and Great Britain, among the great powers, not only to support of the Chinese Gov. but also gradual relinquishment of their privileges; and this reacted against Japan, which stood alone in supporting territorial and political imperialism in C. and in doing so against the interests of the great W. democracies. C. in 1937 was well on the way to attaining the rank for which her pop. and resources qualified her, but which her prolonged repudiation of W. civilisation and the ensuing period of civil strife and confusion had hitherto denied her. The turning-point was the Leth-ross mission to C. in the winter of 1935–6; this, and the Chinese currency reform then successfully carried out with the co-operation of Brit. banks, constituted in Jap.

opinion the abandonment by Britain of her traditional pro-Jap. policy. The prospect that C. would soon be receiving large credits for industrialisation on the basis of her new financial stability was one that alarmed the rulers of Japan. Brit. financial support was a factor of vital importance in enabling C. to withstand the Jap. invasion; hence the Japanese now believed that the only way to win the war against C. was to drive Britain by pressure and threats into withdrawing this support. The primary motive of Japan in the war which began in 1937 with the clash at Lukouchiao, SW. of Peking, was to prevent C. from becoming a great power. Hence arose a great struggle, involving directly 500,000,000 people in the 2 warring states, a conflict which would have been continually absorbing the attention of the world were it not for the war of even wider scope which was threatening to break out in Europe and involve all the great powers of the W. The conclusion of the Matsuoka Pact between Japan and Russia (April 1941) dismayed the Chinese Gov. of Chungking, although Chiang Kai-shek himself never lost confidence in the W. powers. Despite the pact it soon became evident that C. had no cause for apprehension. Moscow intended to continue assistance to C., and Britain and the U.S.A. announced new currency credits. Although relations between the Chungking Gov. and the Chinese Communists could best be described as merely an armed truce, the higher leaders on both sides appeared determined to prevent the dispute from interfering with C.'s resistance to the invaders. At the beginning of 1941, however, a new conflict took place between Chiang's troops and the Communist-led New Fourth Army in S. Anhwei. The Communists had been operating behind the Jap. frontier ever since Chiang's troops retreated to the interior in 1938, and their success in guerrilla warfare had earned some fame. In an attack which was only possible via Jap. occupied areas, Chiang managed to inflict 14,000 casualties on the New Fourth Army and captured its commander, Gen. Yeh T'ing. The remainder of the New Fourth Army was ordered to retreat to N. Anhwei. This was the first breach of the Kuomintang-Communist co-operation, and it was destined to precede further conflicts between the two in the later stages of the resistance war.

After repeated raids, with large numbers of war planes, the Japanese had, by mid 1941, still failed to realise that they could bomb Chungking for years without much effect. The city had the finest passive air defences. Dug-outs were built in solid rock capable of sustaining direct hits by the heaviest bombs. The rebound from the Matsuoka Pact came quickly in the Brit. and Amer. credits, the arrival of an Amer. air mission in Chungking, and the Brit. ambas.'s assurance that the Burma Road would be kept open. C. also gained international prestige when the 3 leaders of Great Britain, the U.S.A., and C. met in Cairo

in Nov.-Dec. 1943, and pub. the Cairo declaration on 1 Dec. that 'the territories Japan has stolen from the Chinese, such as Manchuria, Formosa (Taiwan), and the Pescadores, shall be restored to China.' The terms of this declaration were again affirmed in the 3 gov.'s' Potsdam declaration on 26 July 1945.

The Communists were, however, considerably increasing their power, especially in the later years of the Second World War. They had no confidence in many of the Kuomintang leaders, who, they averred, had been at least as interested in fighting them as in fighting Japan. In the later stages of the war in C. guerrilla activity by the Communist forces rather than regular warfare by Chiang's troops contained the larger part of the Jap. forces. In early 1944 some 22 divs., or 64 per cent of the Jap. forces in C., were operating against Communist troops behind the regular front. The Japanese began an offensive in Honan just before this time, but even then the forces withdrawn from those operating against the guerrillas were small. In addition to these Jap. forces, the puppet army of 750,000 men under Wang Ching-wei was engaged against the Communists. Yet in this struggle behind the regular fronts there were few large battles. The Communist forces claimed, however, that in the 12 months between June 1943 and June 1944 they accounted for nearly 200,000 Jap. and Chinese puppet forces, besides taking 75,000 prisoners. During 1941 and 1942 the Japanese gained some ground, but from 1943 were losing. The pop. paying taxes to the Communist regime rose from 50,000,000 to 80,000,000, the Japanese lost or abandoned 13,000 forts, involving a consequent loss of motor roads and blockade ditches, and in the first half of 1944 the Chinese Communists recaptured 24 *hsien* (co.) cities and retained control of at least a third of them. With some justification the Communists claimed that only their forces, at this time, had been able to carry on effectively this war behind the enemy lines, even though they had received no supplies from outside, even from Russia; and they maintained that in 1941 there were nearly 1,000,000 Central Gov. troops fighting behind the Jap. lines, but that by 1944 their number was no more than 30,000, many having deserted to the enemy. By this time the main Communist forces behind the Jap. regular front were the Eighth Route Army, with 320,000 men serving in an area extending from the Lunghai Railway up to S. Jehol and Liaoning in Manchuria; the New Fourth Army of 150,000 operating S. of the Lunghai Railway in Kiangsu and parts of Anhwei, Hupeh, and Chekiang; and small forces operating near Hong Kong and on Hainan Is. But the limiting factor of the operations of these Communist armies was shortage of ammunition. They had nothing but what was captured from the enemy or made in small local arsenals. This shortage enforced close-range fighting and often made it impossible to liquidate a Jap. force after it had been

surrounded. Moreover the shortage prevented them from bringing about any serious dislocation of Jap. railway communications or damage to industrial installations. With reasonable ammunition supplies, the Chinese Communists might have been able to weaken the whole Jap. position in N. and central C., and it was a situation which clearly offered a great opportunity in the allied war effort against Japan. But the Kuomintang had for some years enforced a strict blockade of the Communist areas. The Communist party considered that it was impossible to overcome C.'s military and economic difficulties without the introduction of democratic reforms, and they could certainly make political capital out of the comparative success of their armies operating under logistic difficulties, but with full popular support, as against the rapid collapse of the Kuomintang armies in Honan and their severe defeats in Hunan. It was generally believed in Yen-an, the Communist centre, that the widespread desertion of Kuomintang forces to the puppet armies was the result of a deliberate policy to build up a force which could preserve N. C. for the Kuomintang after the collapse of Japan. Falling an agreement between Yen-an and Chungking, indications in 1944 were that the collapse of Japan would leave N. C. in the hands of the Communist forces and that it would be extremely difficult for the Kuomintang to dislodge them.

China after the Second World War. C. greeted the Jap. surrender with mixed feelings. Since April (1945) negotiations had been going on intermittently in Moscow between the Chinese Premier, T. V. Soong, brother-in-law of Chiang, and Soviet leaders. In Aug. it was announced in Chungking that a treaty had been signed with Russia by which C. agreed to let Russia jointly use Port Arthur and Dairen and the Chinese Changchun railways for 30 years. C. also agreed that Outer Mongolia, over which C. had hitherto enjoyed suzerainty but in which Russian influence had been increasingly exercised since 1921, was to decide by referendum whether she wanted to be independent from C. It was later revealed that the treaty was in fact part of the secret agreement reached in Yalta in Feb. 1945 without the participation of C.

Shortly after the conclusion of the Sino-Jap. War, Chiang's half a million best troops under Gen. Hu Tsung-nan, who had been encircling Yen-an since 1940, began operating in N. Shensi and captured the Communist bases of Ts'unhua and other towns. In other parts of C., Shansi, Hopei, Chahar, and Manchuria, conflicts between Communist and the former puppet troops were also reported. The whole country was on the brink of civil war. The Communist leader, Mao Tse-tung, flew to Chungking in Sept. to negotiate with Chiang, and agreement was reached on 10 Oct. that a Political Consultative Conference to include the 5 main parties should be convened to

settle their differences. But before the conference took place Communist bases were attacked in Hopei, Shensi, Honan, Anhwei, Hupeh, Chekiang, and Kwangtung. In the midst of this confused situation Central Gov. forces were landed at Chingwangtao from Amer. transports with a view to wiping out all the Communist bases in Manchuria and Hopei. Meanwhile the Russian forces in Manchuria had announced that they were withdrawing from the country (under the terms of a Sino-Soviet treaty concluded since the war) and that Central Gov. troops were due to take over Manchuria. Chiang, however, requested the Russian troops to stay on as from 6 Sept. for another 3 months in order to gain time for him to ship his troops there. To this request the Russians readily agreed. On 4 Nov. 1945 an overwhelming force of Communists captured Kweisui, cap. of the prov. of Suiyuan. Ten days later powerful gov. forces landed in Tsingtao in a determined effort to clear Shantung of the Communists. After these events a military and political truce was arranged between Chungking and the Communist representative Chou En-lai; but in Feb. 1946 civil war prevailed in Manchuria. Following close upon the successful advance of the gov. troops in Manchuria in the summer of 1946, a 15-day truce was arranged during which the Amer. mediator, Gen. Marshall, made an effort to find a basis for a permanent settlement of the Chinese civil war, but with no real hope of success. The 'unofficial war' between the Communist and gov. or Nationalist forces, which had been dragging on for a year or more, flared up in July (1946) into what seemed to be a full-scale test to decide who should be master. The situation was the more confused from the fact that the Communists frequently asserted their faith in Chiang Kai-shek personally, while it was still open to them to enter the Coalition Gov. agreed upon at the Chungking conference of all parties in Feb. (1946). The gov., for its part, also protested that it still earnestly desired to end the conflict by agreement through the peace envoys of Gen. Marshall. Meanwhile Nationalist forces were launching an attack on the Communist front in Kiangsu, N. of the Yangtze, and developing an offensive in the Kirin prov. of Manchuria, employing in these general attacks quantities of lend-lease Amer. weapons, including destroyer escorts, minesweepers, and aircraft. Early in Aug. Nationalist aircraft made a strong attack on the Communist cap., Yen-an. Late in Aug. (1946), in Manchuria, Communist forces struck a blow at the railway between Mukden and Changchun, and in C. proper fighting was in progress in Shansi prov., but Nationalist reinforcements were quickly sent to save the railway. The efforts of the Amer. mediators were still politely welcomed. Gen. Marshall and Dr Stuart had obtained the assent of both sides to the appointment of a committee, under Dr Stuart's chairmanship, to discuss the formation of the State Council which was

to be the mainspring of the projected Coalition Gov. According to the Chungking agreement the council was to consist of 40 members, half from the Kuomintang and half from the other parties, and its constitution was designed to mark the formal ending of the Kuomintang dictatorship and the dawn of a democratic system. But the efforts of the mediators were now being frustrated by the rapid march of military events. An advance by the better equipped Nationalist troops on the Communist centre of Kalgan

were ordered home. The announcement of these measures was made in Nanking (17 Feb.) with a frank statement by Chiang Kai-shek that C.'s survival as a nation was at stake.

Nanking Government loses Manchuria and North China to the Communists. The refusal of the gov. to carry into effect the political accord embodied in the resolutions adopted by the Political Consultative Conference in April 1946 gave the Communists legitimate ground for complaint, though the incurable suspicion in



New York Times Photos

IN THE VILLAGE OF LISON, FIVE MILES NORTH-EAST OF TSINGTAO,
SHANTUNG PROVINCE

threatened to undermine the entire position of the Yen-an administration in N. C. The Communists had now also suffered equally serious reverses in Manchuria; Harbin and Kirin were now threatened. At the end of Jan. (1947) the U.S. Gov. formally abandoned its long sustained effort to mediate in the quarrel, criticising extremist elements in both Chinese camps and suggesting that the salvation of C. lay in the assumption of leadership by the Liberals in the Kuomintang and the minor political parties. The severity of the Chinese Gov.'s remedial measures in Feb. matched the seriousness of the country's economic plight. Her currency was pegged at a realistic level, and stringent war-time controls were reintroduced. The rate of exchange was now 12,000 Chinese dollars for 1 Amer. dollar. Trade in gold and foreign currencies was prohibited and private fortunes abroad

which they held the Kuomintang was the primary cause of their failure to accept the army reorganisation upon which Chiang Kai-shek insisted. Hence the continuance of the civil war, which now dragged on into 1947. The position in the early months of 1947 was that Chiang was directing his operations to the restoration of communications on the Tientsin-Pukow and Lung-Hai railways in N. C., and to the recovery of the ter. N. of Changchun up to the N. Sungari R. In Mar. (1947) the gov. announced their occupation of Yen-an, the remote Communist cap. in Shensi. But that stronghold had been stripped and deserted so that its seizure had no great strategical effect on the anti-Communist campaign. The strength of the Communists in C. depended upon the contrast existing in public opinion between certain meritorious features of the system they practised and

the many evils which the gov. still tolerated within its own ters.

In July the Chinese State Council decreed 'total mobilisation' and the ban of the Democratic League, a party formed mostly by univ. profs. and intellectuals, an indication of the serious crisis facing the Nanking Gov., which had at this time suffered in its ill-advised attempt to suppress the Communists by force of arms instead of effecting salutary reforms while permitting the Communists to exist in a separate state N. of the Yellow R. The significance of the crisis lay in the gov.'s frank acknowledgment of its dependence upon Amer. aid to enable it to carry the civil war to a successful conclusion. Hence the popular suspicion that America by aiding Chiang was in fact encouraging him to carry on the internecine war as well as his dictatorial rule, though in fact the U.S.A. was continually urging Chiang to fight Communism by internal reform as well as military weapons. After the Second World War political reorganisation left the Kuomintang in effective control behind a democratic façade, but was not an honest attempt to carry out the proposals of the Joint Political Consultative Conference of 1946 on which many hopes were based by C.'s friends abroad. The Communists and the Democratic League had held aloof, while the Kuomintang and its offshoots, the Youth party and the Democratic Socialists, had abandoned all pretence of conciliation. Chiang Kai-shek, relying upon his Amer.-trained and equipped troops, was confident of speedy victory earlier in 1947 when he launched an all-out offensive against the Communist-held areas; but following the Pyrrhic victory of the capture of Yenan, the tide of war turned. The Communists, with the support of the rural pop., concentrated on attacking communications and, keeping their own forces intact, inflicted great losses on the gov. forces. Heavy fighting continued in the summer (1947) in Manchuria, where gov. forces were still struggling to reopen the railways. The military misfortunes of the gov. served to aggravate its economic plight, which in turn made the prosecution of the war more difficult without foreign aid.

Towards the late autumn of 1947 the situation of the Nanking Gov. had deteriorated markedly. In Shantung large Communist forces had escaped into Kiangsu; others had overrun Honan, Anhwei, and E. Hupeh, and reached the N. bank of the Yangtze; while those driven out of N. Shensi in Mar. had seized fresh areas of hitherto unoccupied ter. in the neighbouring prov. of Shansi. Another group of Communist forces had crossed the Yellow R. from S. Shansi and spread into W. Honan. In Hopei the N. section of the Tientsin-Pukow railway and the Peking-Paoing corridor along the Peking-Hankow railway had been lost by the gov., and the Peking-Paoing-Tientsin triangle, which they had cleared in Sept., had now been reoccupied by the Communists. In Manchuria the

situation was even worse: the narrow corridor along the main railway, held by gov. forces, had now been reduced to a few isolated areas, and the whole forward area N. of Changchun to the Sungari R. had been abandoned.

By Mar. (1948) the whole of Shansi was in the hands of the Communists. Honan was almost completely overrun, except for a large patch with Chengchow at the centre. The Communists had strengthened their grip over Manchuria and N. C., while the S. Manchurian Railway was largely destroyed. The Peking-Mukden line had been out of commission for sev. weeks, and large portions wrecked. With the loss of Liaoyang and Panshan, 2 important ports to the SE., Mukden was further isolated. The whole NE. of Hupeh was in the hands of the Communists, who had now cut the Hankow-Ichang waterway, and were pushing westwards. In the spring of 1948, under Amer. pressure for democratisation, Chiang summoned the National Assembly, whose members were elected or appointed by himself in 1936, to elect a president and a vice-president. He was elected president, but his own candidate for the vice-presidency, Sun Fo, was defeated, and Gen. Li Tsung-jen was elected vice-president.

The strength of the Communist party, which had enabled it to hold its own against the numerically stronger and better equipped forces of the gov., was largely due to the enthusiasm and idealism of its leaders; to the discipline and able command of its military forces; to its able conduct of guerrilla warfare; to the economic benefits it promised to a poor country like C.; to the vast peasant support it enjoyed; and to the growing discontent towards the Kuomintang, coupled with chaotic economic conditions.

The interminable war was inflicting grievous misery on a third of C. Inflation was followed by a tremendous increase in the cost of living and flight of capital. There were serious rice riots in W. and central C.; the provs. were proving insubordinate towards the Central Gov.; there was general unrest among all classes. The overall picture in C. towards the end of 1948 was that the Nanking Gov. had made no attempt to check the corruption that prevailed in higher official circles. No attempt had been made to tax the wealthy to pay for the war. None of the chief Nationalist generals had been superseded or punished for inefficiency. Foreign trade was dwindling, gov. monopolies were increasing, and the gov. had formulated no definite economic plans, such as might be expected of any realist gov. which was determined to exorcise the spectre of popular discontent, and to defeat a rebellion which owed its success less to victories over ill-fated Nationalist armies than to the gov.'s administrative sins of corruption and suppression. Meanwhile there was a rapid debacle in Manchuria, which indicated the complete collapse of the morale of the Nationalist armies. Whether further Amer. aid could have

saved them is doubtful. The culminating point of the Nanking Gov.'s ineptitude came at the end of Oct. (1948) when Communist troops broke into Mukden. This irruption, which in effect marked the turning-point of the civil war, was soon followed by the fall of the city and the surrender of its once-powerful Nationalist garrison. The elimination of the garrison of Mukden meant that the Communists, now masters of Manchuria, could concentrate against the few remaining strongholds of the gov. in N. C., and the fall of Taiyuan, cap. of Shansi, was expected at any moment, for Gen. Fu Tso-yi, who was responsible for the defence of N. C., had insufficient troops and arms to hold out against Communist forces who were superior in numbers and well armed—with captured Nationalist arms and equipment—and contemplated withdrawal into Chahar and Suiyuan.

The immediate reason for the disastrous turn in the military situation—which lost the gov. in succession Chefoo, Kaifeng, Chinchow, Changchun, and now Mukden—apart from faulty generalship, was the poor morale of the Nationalist forces. The news of the surrender of the Changchun garrison of 80,000 men, which refused to continue fighting, had a further depressing effect on the spirit of the other gov. forces, and in fact was followed by the surrender of 7 divs. in the corridor (a small strip including Peking and Tientsin), thus sealing the fate of Mukden and Manchuria. Gen. Fu was now in a hazardous situation. With a force of no more than 300,000 his task was to hold a front reaching in a vast arc from Paotow, in the NW., to Shanhaikwan, in the E.; while some of his divs. were strung out along the Peking-Hankow line well S. of Paoting. The Communist armies, flushed with victory, had above all been enormously reinforced with captured arms, artillery, munitions, and other equipment.

It was not long before the Communists followed up these successes by thrusting southward along the Hsuehchow defence line protecting Nanking, the gov.'s plight being aggravated by food riots in Nanking and Shanghai which only ended with the imposition of martial law (11 Nov.) and by a quickening spiral of inflation. At the end of Nov. the 250,000 troops making up the Nationalist garrison of Hsuehchow, following some weeks of confused fighting, abandoned the stronghold on orders from Nanking to hasten to the relief of the 140,000 troops of the Twelfth Army Group now encircled SW. of Suhsien. This latter group had not long previously marched eastwards through Anhwei prov. to the support of their outnumbered comrades in the Suhsien area. The Hsuehchow garrison and other troops comprising 3 Nationalist army groups had failed to relieve the Twelfth Army Group and, in their abortive efforts to do so, had sustained 30,000 casualties. In the rapidly deteriorating situation Chiang on 10 Dec. ordered the extension of martial law to the whole of C. under Nationalist control except the W. provs.

and Formosa. About the middle of Dec. the situation around Peking suddenly took a serious turn for the worse from the gov.'s standpoint, for Gen. Lin Piao's well-trained Manchurian troops, having driven back Gen. Fu Tso-yi's best gov. troops on a front 30 m. E. of the line Peking-Tientsin-Tangku, had advanced to within 10 m. N. of Peking, and the W. airfield, only 3 m. outside the city, was evacuated. The gov. forces, which had abandoned Hsuehchow and withdrawn 100 m. southwards to Pengpu, from where they estab. a new line of defence for Nanking along the Hwai R., now made a further withdrawal, this time to Chuhsien, only 30 m. NW. of the cap.

With the fall of Hsuehchow the result of the civil war was no longer really in doubt. Chiang summoned a military conference in Nanking, but very few commanders-in-chief or prov. governors came. In N. C. Tientsin was captured by the P.L.A. (People's Liberation Army) on 15 Jan. 1949, after 3 days of fierce fighting. On 21 Jan. Chiang Kai-shek was forced to resign by the Sun Fo-Li Tsung-jen faction and Li Tsung-jen, the vice-president, became acting president; Sun Fo was appointed premier. Li's first act was to disband the secret police and to free political prisoners, but his orders were largely ineffective, for the secret police was Chiang's personal force and would obey no orders from anyone else, and the amnesty only served to shorten the lives of those in concentration camps. The P.L.A., under Gens. Nien Jung-chen and Lo Jung-huan, were now besieging Peking, and, after 2 weeks' negotiations, Fu Tso-yi peacefully handed over the angt cap. to its new master on 31 Jan. In Mar. Li Tsung-jen sent a peace delegation headed by Gen. Chang Chih-chung, governor of Sinkiang, and Shao Li-tzu, once ambas. to Moscow and now secretary-general of the national assembly, to Peking to discuss terms. On their arrival they chose to stay with the Communists. In April Sun Fo moved the gov. to Canton, the cradle of the revolution of his father, Sun Yat-sen, but the vice-president stayed on in Nanking. The P.L.A. crossed the Yangtse in force on 20 April, and during the operation damaged the Brit. destroyer *Amethyst* and caused some casualties. Nanking was entered on 23 April, thus bringing formally to an end the 22 years' rule of Chiang Kai-shek's regime. Events now moved rapidly. The governor of Suiyuan, a subordinate to Fu Tso-yi, was persuaded by Fu to change his allegiance to the new authority, and other NW. provs. soon followed suit. In S. C. the rulers of Hunan and Yunnan peacefully changed sides. Kuomintang troops in Shanghai and other coastal areas fled to Taiwan and Hainan is. While the P.L.A. marched S. practically unopposed, the Nationalist Gov. moved back to Chungking, but this time the country failed to rally to them. When the People's Gov. was set up in Peking on 1 Oct. 1949 the old one had withdrawn to Taiwan, with Chiang again at its head.

When the Nationalist Gov. had come

to power in 1927, the Chinese had hoped that Chiang Kai-shek would put an end to the former warlords' civil wars and would industrialise C. according to Sun Yat-sen's *Plan for National Reconstruction*. Apart from his ruthless purges and unsuccessful military campaigns against the Communists, whom Sun Yat-sen welcomed as allies and who greatly helped him in his early revolutionary cause, Chiang constantly engaged in civil wars with troops inside his own party. It is on record that during his 10 years' rule before the Sino-Jap. war there had not been a period of 3 months in which there was no civil war between his 'Central' troops and other 'Local' forces. But Chiang's 'military tutelage' regime excluded any non-Kuomintang party members from his gov., and all other political parties, left or right, were soon forced to go underground. His alliance with the class of vested interests in Shanghai and other big cities alienated the vast majority of the people, especially the peasants who constituted 90 per cent of the pop. Until about 1937 a new liberal-minded middle class, which could have been the mainstay to check Communism as well as right-wing extremists, was gradually emerging in the cities; but it was systematically destroyed by the subsequent inflation. As a result, the white-collar workers were merged with the peasant masses, and this made the alliance of the intellectuals with the Communists iron-cast. Added to the scourge of inflation was Chiang's increasing reliance on his secret police force, which infiltrated into every corner of Chinese life, from the office of a cabinet minister to the canteen of the grammar school. The massacre of univ. students in Kunming in the spring of 1945, and the assassination of the educationist Li Kung-po and the Prof. of Classics, Wen-I-to, within 1 month of the Jap. surrender, put a last touch to the united front of the peasants and scholars against the Chiang regime. In the last stage of the civil war, the indiscriminate bombing by Chiang's Amer.-built aircraft drove the vast mass of the pop. to the Communist side, turned the civil war into a semi-foreign war, and, ironically enough, weakened the morale of Chiang's own troops who, after all, were part of the poor peasantry. The final defeat of Chiang's Kuomintang, and the estab. of a Communist regime in its place, must be considered one of the most important historical events of the 20th cent.

The People's Republic of China. The Central People's Gov. of C. was set up by the Chinese People's Political Consultative Conference which was convened from 21 to 30 Sept. 1949 in Peking by representatives of the Chinese Communist party, the Revolution Committee of the K.M.T., the Democratic League, the Democratic Construction Association, the Democratic Promotion Association, the Chinese Peasants' and Workers' Democratic party, the China Chih-kung party (oversea Chinese), the Chiu-san Society (profs., lecturers), the Taiwan Democratic Autonomous League, trade unions, and popular organisations, and non-

party leaders. At this conference a *Common Programme* was adopted and it confirmed the *Organic Law* of the Central People's Rep. and elected Mao Tse-tung as chairman of the People's Rep. of C. Among the 6 vice-chairmen elected were Mme Soong Ching-ling, widow of Sun Yat-sen, Gen. Li Chi-shen, an old comrade of Sun, and Chang Lan. On 1 Oct. 1949 Chairman Mao declared the People's Rep. of C. estab. with Peking as its cap. He declared his gov. the only legal gov. of C. and stated that it was prepared to enter into diplomatic relations with any foreign country which would agree to the principles of equality, reciprocal benefits, and mutual respect for territorial integrity and sovereignty. On 3 Oct. Moscow announced its decision of 2 Oct. to recognise the People's Rep. of C. On 5 Oct. diplomatic relations were estab. with Poland, Czechoslovakia, Rumania, N. Korea, and sev. E. European countries. Burma, India, Indonesia, Britain, Pakistan, Switzerland, and the Scandinavian countries recognised the Peking Gov. In Jan. 1950. A Chinese delegation, led by Mao, arrived in Moscow on 16 Dec. and was later joined by Chou En-lai, the premier and foreign minister. A treaty between the 2 countries 'of friendship, alliance, and mutual assistance' was signed on 14 Feb. by which Russia agreed to transfer to C. the Changchun railways, Dairen, and Port Arthur upon the conclusion of a peace treaty with Japan or not later than the end of 1952 instead of the '30 years' stipulation in the Soviet-Chiang treaty of 1945. Russia also agreed to hand over to C. the administration of Port Arthur and Dairen and all property in Manchuria leased to Russia in the 1945 treaty. At the same time C. received a large credit loan from Russia to the value of U.S. \$300,000,000.

America had still not recognised the People's Rep.; and when the Korean war broke out, in June 1950 (see KOREAN WAR), the Amer. attitude to C. hardened. The U.S. 7th fleet was ordered to protect Formosa from a possible Chinese attack, and Amer. military aid to the Fr. forces in Indo-C. was accelerated. On the other hand, the U.S.A. rejected Chiang's offer of troops to help the U.N. forces in Korea. In Sept. 1950 Chou En-lai gave notice that if Amer. troops crossed the 38th parallel C. would intervene. On 8 Oct. the U.N. passed a resolution which authorised Gen. MacArthur to cross the parallel, and in Nov. a Chinese 'volunteer' force was sent to N. Korea. This conflict helped to increase Amer. bitterness against C.; the U.S.A. continues to withhold recognition of the Peking Gov., which is still (Jan. 1958) denied representation at U.N.O. Though recognised by most other W. powers, C.'s relations with them have been strictly limited since 1949. Until recently C.'s trade with non-Communist Europe was virtually nil; but a change in the situation was brought about in May 1957 by the Brit. Gov.'s announcement that it intended to relax restrictions on trade with C. There are increasing trade, cultural, and political contacts with India

and other countries of Asia, and in 1956 Chou En-lai visited sev. non-Communist Asian caps.

The Chinese People's Rep., with Russian financial and technical aid, has greatly improved the living standard of the masses, and is carrying through a vast programme of industrialisation and agric. mechanisation. See articles on the various provs. and prin. cities mentioned above.

Architecture, Art, Pottery. See CHINESE ARCHITECTURE, ART, POTTERY.

Literature. See CHINESE LITERATURE; BUDDHISM; CONFUCIUS; LAO-TZŪ; LU HSŪN.

For important cities see AMOY; ANSHAN; CANTON; CHENGCHOW; CHENG TU; CHUNGKING; HANGCHOW; HARBIN; HONG KONG; KUNMING; KWEILIN; LANCHOW; LEASA; MACAO; NANKING; PAOTOW; PEKING; PORT ARTHUR; SHANGHAI; SHENYANG (MUKDEN); SIAM; TAIPEH; TIENSIN; TSINGTAO; URUMCHI (TIHWA); WUHAN (HANKOW).

See also BOXERS, THE; CAVES OF A THOUSAND BUDDHAS; CHIANG KAI-SHEK; CHOU EN-LAI; CHU TEH; DZUNGARIA; GRAND CANAL, THE; JENGHEIZ KHAN; KOREA; KUOMINTANG; LIU SHAO-CHI; MANCHURIA; MANDARIN; MAO TSE-TUNG; MONGOLIA; SINKIANG; SINO-JAPANESE WARS (1894, 1931); SUN YAT-SEN; TAIWAN (FORMOSA); TIBET; TSAIDAM; WALL, GREAT, OF CHINA; YALU; YANGTSKIANG; YELLOW EM. PEROR (HUANG TI); YELLOW RIVER.

Bibliography. HISTORY AND CIVILISATION, GENERAL: Liang Ch'i-ch'ao (trans. C. T. Chen), *History of Chinese Political Thought*, 1930; J. G. Andersson, *Children of the Yellow Earth*, 1934; G. B. Cressey, *China's Geographical Foundations: a Survey of the Land and its People*, 1934; H. G. Creel, *The Birth of China*, 1936; Tsui Chi, *A Short History of Chinese Civilisation*, 1942; L. Carrington Goodrich, *A Short History of the Chinese People*, 1943; J. Needham, *Science and Civilisation in China* (vol. 1, 1954; vol. II, 1956). RECENT HISTORY, POLITICS, etc.: Sun Yat-sen, *The International Development of China*, 1920; B. Russell, *The Problem of China*, 1922; H. O. Chapman, *The Chinese Revolution*, 1928; P. Monroe, *China, A Nation in Evolution*, 1928; Sir R. F. Johnston, *Confucianism and Modern China*, 1934; O. Lattimore, *Manchuria, Cradle of Conflict*, 1935; Mme Chiang Kai-shek, *China at Crossroads*, 1937; E. Snow, *Red Star over China*, 1938; H. S. Quigley, *Far Eastern War, 1937-41*, 1942; Sir J. T. Pratt, *War and Politics in China* (Brit. policy in the Far E.), 1943; F. C. Jones, *Manchuria since 1931*, 1948; U.S. State Dept., *United States' Relations with China, 1944-1949*, 1949; C. P. Fitzgerald, *Revolution in China*, 1950; Ch'ien Tuan-sheng, *The Government and Politics of China*, 1950; C. Brandt, B. Schwartz, and J. K. Fairbank, *A Documentary History of Chinese Communism*, 1952; I. F. Stone, *The Hidden History of the Korean War*, 1952; Mao Tse-tung, *Selected Works of Mao Tse-tung* (Eng. trans., vols. 1-IV), 1952-6; M. Beloff, *Soviet Policy in the Far East, 1944-1951*,

1953; P. Townsend, *The Revolution in China*, 1955; K. M. Panikkar, *In Two Chinas*, 1955; Ping-Chia Kuo, *China: New Age and Outlook*, 1956; Liu Tsun-chi (ed.), *People's China* (fortnightly), 1950 onwards.

China Aster, *Callistephus chinensis*, variable Chinese annual, sole species of its genus, introduced in 1731, family Compositae.

China Bark, one of the names applied to the bark which yields the drug cinchona.

China Clay, Eng. name for kaolin (q.v.).

China Grass, see BOEHMERIA.

China Root, name given to the root of the tropical vine, *Vitis sicyoides*, and also to that of the liliaceous plant, *Smilax china*. The latter plant is used medicinally, and others of its genus yield sarsaparilla.

China Sea, South (Chinese Nan Hai, or South Sea), that portion of the Pacific Ocean lying to the E. of China and Siam, being bounded by China and Formosa on the N. and NW., the Philippine Is. on the E., Borneo on the S., and the Malay Peninsula and Indo-China on the W. and SW. It forms the great gulfs of Siam and Tongking. Its chief affluents are the R.s Meikong, Cambodia, Pearl, Mekong, Songkoi, and Sikiang. The chief ports are Canton, Manila, Bangkok, Singapore, Hong Kong, and Saigon. Greatest depth, 14,250 ft.

China-stone, Eng. name for petuntse (q.v.).

Chi-nan, see TSINAN.

Chinandega, city in C. Dept. Nicaragua, with important cotton, sugar, timber, and related industries. Connected by rail with the country's main port (Corinto) and all prin. cities. Pop. 16,171.

Chinaware, term nowadays used solely to denote Eng. 19th- and 20th-cent. bone-porcelain or bone-china. It is a hybrid paste containing china-clay and china-stone in combination with bone-ash. First introduced by Barr at Worcester and by Spode at Stoke-on-Trent about 1806, it became the standard Eng. body. Bone-china is softer than hard-paste porcelain, but less costly to produce and more durable than the Eng. soft-paste porcelain of the 18th cent. A high standard was maintained throughout the 19th and 20th cents. at the Minton, Royal Doulton, Royal Crown Derby, and Wedgwood works. See DERBY; DOULTON; MINTON; SPODE; WEDGWOOD; WORCESTER.

Chincha Islands, 3 small rocky is. in the Pacific, off Peru (Ica dept), and about 14 m. from the coast. Total area 6½ m. The is. rise to about 200 ft. and were formerly noted for guano, but have now been worked out. Lat 13° 39' S.; long. 76° 25' W.

Chincherinchee, S. African name for *Ornithogalum thyrsoides*, a bulbous plant valued for its long-lasting white flowers.

Chinchilla de Monte Aragón, Sp. tn in the prov. of Albacete, with a striking 15th-cent. church and an anct. castle. There are lead mines near by. Pop. 7450.

Chinchillidae, family of rodent mammals estab. by Bennett, consists of sev. genera of S. Amer. animals allied to the agouti

(q.v.). All the species have long limbs, bushy tails, very soft hair, and resemble squirrels to some degree. *Chinchilla laniger* is the true chinchilla, a little creature with large eyes and ears, and its fur is so much sought after that it is diminishing in numbers. In habit it is gregarious and subterranean, and in disposition it is mild. *Lepidium* is another genus which has its habitat in the higher Andes, and the third genus consists of 1 species, *Viscacia viscacia*, the viscacha.

Chinchón, Sp. tn in the prov. of Madrid, 25 m. SE. of the cap. Pop. 11,000.

Chinehow, tn in the prov. of Liaoning, China, on the railway from Mukden to Peking, near the Gulf of Liaotung. It is a transport centre. Pop. 190,000 (1951).

Chinde: 1. Riv. of Portuguese E. Africa, mouth of the Zambesi R. which empties into the Indian Ocean.

2. Seaport of Portuguese E. Africa, at the mouth of the C. R., most of the trade of which has now gone to Beira. Sugar, cotton, and sisal are exported. From 1891 until 1922 Great Britain had the right to store foods in transit to Nyasaland duty free. Pop.: Europeans, 472; Indians, 466; natives, 138,000.

Chindwin, or Kyendwin: 1. Riv. of Upper Burma. It rises in the Patkoi Mts near the Assam frontier, and flows S. for about 500 m., joining the Irawadi on the r. b. between Mandalay and Pagan. During the rainy season the riv. is navigable for 150 m. from its mouth by light craft only. On 16 Mar. 1944 the Jap. Gen. Mutaguchi's Fifteenth Army crossed the riv. with the intention of reaching Imphal and Kohima before allied reinforcements could arrive and then breaking into the Brahmaputra valley. But the 5th Indian Div. was flown up from Chittagong and 2 brigades were landed at Imphal, where they formed the necessary reserve. The Japanese were heavily defeated at Kohima and Imphal, and the remnants of their 31st and 15th Divs. were driven back across the Chindwin R. by the 33rd Corps. By summer the Allies reached the junction of that riv. with the Irawadi and the advance on Mandalay was begun. See **FURTHER BURMA, SECOND WORLD WAR CAMPAIGNS IN.**

2. Name given to 2 dists. in Sagaing, Upper Burma. The upper dist. is mountainous and covered with forest. Area 16,037 sq. m. Cap. Mawlaik. Pop. 210,000. The lower dist. is partly wild and wooded and partly a fertile rice-producing plain. Area 3480 sq. m. The cap. is Monywa. Pop. 428,000.

Chinese Architecture. The early Chinese tribes were cave dwellers, but palaces built with wooden pillars have been discovered in the Great Shang City of the 14th cent. BC. The temples are chiefly of wood, on a tall stone base, and decorated in bright colours with glazed tiles, etc., and the construction is remarkable in that the roof is not supported by the walls, but by a wooden framework. It is, in fact, put on before the panels of the wall are filled in. Wood carving plays an important part in the interior of a Chinese

building. The use of brick and stone has been known to the Chinese since very early times; the latter has been used chiefly for city walls, embankments, bridges, and pagodas. The stone arch was known in ancient China and some of the long bridges have 10 or more arches. See p. 410.

Chinese Art. In painting the Chinese long ago attained a degree of excellence reached only by the greatest masters of the art. Chinese art was on a lofty plane cents. before the modern W. nations had learned even the elements of painting. The landscape painting founded by the Sung artists, in which mts figure so conspicuously, is ranked as the greatest school of landscape painting the world has seen, its merit lying in the imaginative portrayal of the elemental and sublime in nature, while its 'visions of storm and peace among abrupt peaks and of plunging torrents', though often fantastic, are never tame. It is a commonplace that great Chinese artists have no regard for outline as opposed to the spirit of the subject depicted, and Chinese art has languished in later cents. only because popular favour has veered to the productions of the studio artist as opposed to the artist of the *plein air* school. As in poetry so in pictorial art, the Chinese delight in 'suggestion' or leaving something to the imagination of the beholder, and Chinese artists found scope in Impressionism' cents. before that term became current in the Eng. language. Time-honoured stories, like that of the fruit painted so realistically by Zeuxis that the birds pecked at it, are paralleled in the literature of Chinese art; and exhibitions of Chinese pictures held in the present cent. show that the amazing stories of the power and originality of Chinese painting are justified. Among notable Sung artists were the Emperor Hui-tsung, famous for his pictures of white falcons, and Li Lung-mien.

Many examples of T'ang art are to be seen in the Brit. Museum to-day, mostly dealing with Buddhist subjects. In this, the 'golden age' of Chinese art, 2 schools of painting were founded: the N. by Li Szu-hsun, and the S. by Wang Wei. Robust sternness is the feature of the N., and exquisite refinement of the S. Besides the above painters, the greatest painter of the T'ang period was Wu Tao-tzu, the most revered figure in Chinese art, and celebrated as the father of modern Jap. painting. Apparently no paintings of his are extant, but 'The Death of Buddha,' in the Brit. Museum, founded on one of his reputed masterpieces, affords a clue to his powers. Chinese painting in these earlier periods owes much to Chinese poetry, the religion of Taoism, and the Zen form of Buddhism, to all of which influences may be attributed its predominantly symbolic or suggestive spirit.

Shang and Chow bronze vessels are of outstanding merit. Chinese sculptures from the 3rd to 4th cents. are mostly Buddhist statues with strong Indian influence. Sung and Ming lacquer work and porcelain are also known the world

over, the latter being remarkable for the device of coloured glazes and painting beneath the glaze. As regards porcelain, the Ch'ien Lung era was the most prolific in the hist. of Chinese art, and modern W. collections consist largely of specimens of that period. The celebrated imperial potteries of Chingtehchou and Kiukiang, estab. under the experts T'ang kung and



W. Mansell

'GODDESS OF THE DEW'
By Wan Shou-ch'i, 17th century
(British Museum).

Nien, maintained their reputation until the time of the Tai-ping rebellion in the 19th cent., when they were closed, but there has since been a revival of the art. The Chinese have also excelled in the carving of jade, a light or dark green stone, into vases and other objects for ornamental purposes. See J. C. Ferguson, *Outlines of Chinese Art*, 1920, and *Chinese Painting*, 1927; U. Pope-Honnessy, *Early Chinese Jades*, 1923; A. J. Coop, *Early Chinese Bronzes*, 1924; W. G. Gulland, *Chinese Porcelain*, 1928-1929; L. Binyon, *Paintings in the Far East*, 1934; G. Rowley, *The Principles of Chinese Painting*, 1947; W. Cohn, *Chinese Painting*, 1948.

Chinese Eastern Railway. The, is a railway of about 1100 m. in length, running SE. across the N. part of Manchuria. It enters Manchuria on the W. at Manchull, and on the E. it joins the Ussuri railway, running to Vladivostok, at Pogranichnaya, or Suifenho. It has a branch running S.

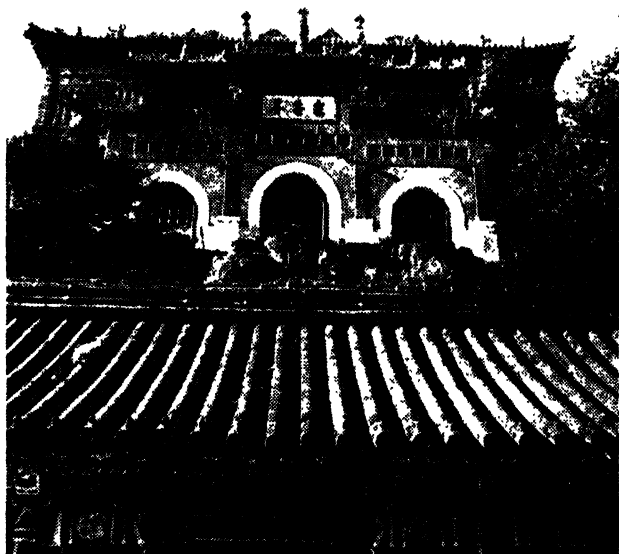
from Harbin and joining the S. Manchuria line at Changchun. The line, which is of the standard Russian gauge of 5 ft., was built in 1898-1903, mainly by Russian and Fr. capital, though the Chinese Gov. had a small holding in its stock. In 1935 the Russian Gov. sold the entire system to the Jap.-controlled gov. of Manchuria, or Manchukuo. It became part of the state system, known as the N. Manchuria Railway. The Hsinking-Harbin section was converted to 4 ft 8½ in. gauge in 1935 and the remainder in 1936. By the Sino-Russian treaty of 1945 the trunk line of the Chinese E. was combined with the S. Manchuria Railway as the Changchun Railway, to be jointly owned and operated by China and the U.S.S.R. for 30 years and then revert to China without compensation. The Sino-Soviet treaty of Feb. 1950 provided for the transfer to China of Soviet rights of co-administration of the Changchun Railway on conclusion of a peace treaty with Japan or not later than 1952.

Chinese Ink. see INK.

Chinese Labour Question. The hist. of the C. L. Q., which so agitated the public mind in S. Africa and Great Britain during the first decade of the present cent., may be traced back to the pre-Boer days. The gold-mine owners of the Rand (Transvaal), in giving evidence before a commission appointed by the Boer gov. (1897), had demanded cheaper coloured labour to work their mines. They pointed out that certain low-grade ores could be profitably mined if the gov. would increase the native hut tax and consent to the estab. of locations in order to compel the Kaffir to work at reduced wages. They further argued that with an increased supply of native labour more white labour would be employed. On the commission reporting adversely on these suggestions, the mine owners talked of the importation of Asiatic labour and of closing down the mines if their demands were refused. President Kruger replied by passing a law which provided that if the mines were not worked by the mine owners, the gov. would confiscate them and work them itself. Then came the war (1899-1902) in which the Kruger gov. was swept away and the Milner regime estab. One of the first acts of Lord Milner was to double the hut tax. At the close of the war the mine owners reduced native wages from 47s. a month to 27s., with the result that at that time only 42,000 natives were working, as against 90,000 at the beginning of the war. On their raising wages next year to their former level, the natives flocked back until their numbers were the same as before the war. In 1903 Lord Milner appointed a commission to inquire into the adequacy or otherwise of the sources of supply of labour for the mines. This commission reported that an additional 129,000 labourers were necessary, and that Central and S. Africa were unable to meet this demand. In the following year an ordinance was carried in the Transvaal Legislative Council for the introduction of indentured labour 'from outside Africa S. of 12° N. of the equator.' This ordinance,

which received the royal assent, was strenuously opposed by the Liberal party in Great Britain and by the Boers and white labourers in the Transvaal. On the other hand, it was claimed that a petition in favour of Chinese labour was signed by a little over half of the white adult pop. The opinion of Cape Colony may be gauged by the fact that in May 1904 a Bill was passed in the legislature excluding Chinese labour from that

Apart from the C. I. Q., no large number of Chinese have entered the Brit. Empire, though some thousands, lured by the gold-fields, went to Australia and increased the total by the middle of the cent. to about 50,000. Political trouble ensued, and the numbers went down steadily, and by 1930 were less than half what they were, a result chiefly due to the Australian immigration tests. A high head tax excludes them from Canada and



THE SUMMER PALACE, PEKING

Harold Davies

The porcelain arch in front of the porcelain Temple of a Thousand Buddhas.

colony. The first shipload of Chinese coolies arrived at Durban on 20 June 1904, and ultimately as many as 80,000 coolies were employed on the Rand. The strong feeling roused in Great Britain against the employment of Chinese labour, freely characterised by opponents as 'Chinese slavery,' was, it is generally conceded, mainly responsible for the overwhelming defeat of the Conservative party at the general election in Jan. 1906. On the granting of a constitution to the Transvaal the Het Volk (or Boer) party obtained a majority in the new chamber, and this party proceeded to redeem its pledge to repatriate the Chinese speedily. Thus 17,000 left in 1907, 28,000 in 1908, and the remainder in 1909.

a poll-tax has the same effect in New Zealand.

Chinese Literature. *Inscriptions on oracle bones and bronzes.* The earliest Chinese writing, found in 1899 in Honan, is inscribed on oracle bones and tortoise-shells from the tombs of Shang kings (14th-12th cents. BC). Excavation of the anc. sites has been going on ever since, and over 200,000 fragments or whole pieces of these inscribed bones and shells have been unearthed, of which 500 are in the Brit. Museum. The bones and shells were used to divine the auspiciousness of the future, and subsequent events, including those concerned with the weather, agriculture, harvest, hunting, fishing, warfare, sacrificial ceremonies, royal

excursions, births and deaths of the royal family, and other similar matters, were carefully recorded and inscribed on them, the longest consisting of over a hundred characters or words. On bronze vessels from the early Chou (11th-6th cents. BC) period are inscribed, in verse or prose, historical events in up to 500 words or more. Inscriptions are also found on Ch'in stones from the 8th cent. BC, known as the 'Stone Drums.'

Confucius and Confucian classics. The belief that Confucius (551-479 BC, q.v.) wrote some of the so-called Confucian classics has been proved unauthentic by



W. F. Mansell

LAO-TZŪ AND HIS DISCIPLES

By Huang Shao-ming, 16th century.

modern scholarship, but, as the founder of the first private univ. in anct China, he collected and publicised many old books and transmitted them to his disciples (who at one time numbered 3000), hence the name of 'Confucian classics.' Of these the *I Ching* or the *Book of Changes* is a heterogeneous collection of material from different eras. Its earliest part (11th cent. BC) is the Divinatory Classic of 64 hexagrams explained in lyric folk-songs. The 'Ten Wings' or appendices, which are later additions (7th-3rd cents. BC), purported to expound the symbolism of the hexagrams, but are in fact treatises on the genesis of civilisation, cosmology, metaphysics, political philosophy, etc. The *Shih Ching* or *Book of Songs* is an anthology of over 300 folk-songs, odes, and hymns of N. China compiled before Confucius' time; the earliest odes, dealing with the origin of the Chou tribe, can be dated in the 9th cent. BC, and many others treat of love, warfare, agriculture, hunting, feasting, marital fidelity, and official tyranny. These songs are trea-

sured by the Chinese to this day for their simple, lyrical beauty, sometimes robust, at other times plaintive, and for their metaphors and similes, often subtle, yet never obscure. The present version of the 54 documents in the *Shu Ching* or *Book of History*, which was supposed to have been compiled out of 1000 documents by Confucius, is in fact a 3rd-cent. redaction with many apocryphal chapters, e.g. the *Canons of Yao and Shun*. However, some Shang and most of the early Chou documents are authentic recordings in the anct language, which is only now beginning to be understood with the help of modern archaeology. The documents are mostly gov. proclamations, admonitions, declarations of war, etc., containing many homilies, proverbs, and aphorisms which are still current in Chinese sayings. Of the 3 Classics of Rites, the *Chou Li* or *Rites of the Chou Dynasty* is really a sort of constitution with all the ramifications of governmental depts and their functionaries listed and described in great detail; the last of the 6 books deals with industry and handicrafts. The *I Li* or *Code of Etiquette* describes at length manners and customs in anct feudal society, including diplomatic punctilio and religious ceremonies. The *Li Chi* or *Record of Rites* is a collection of 46 essays on ceremonies written from the 5th to 1st cents. BC, with interesting stories and illustrative anecdotes. The *Ch'un Chiu* or *Spring and Autumn Annals*, reputed to have been written by Confucius, was the Court Gazette of the state of Lu, of which Confucius was a native. Recording in bare outline the events of 244 years (722-479 BC), this classic is always attached to the *Tso Chuan*, or to one of two other Commentaries, the *Kung-yang Chuan* and the *Ku-hang Chuan*, and in each case the *Annals* together with a *Chuan* is counted one classic; hence with the above mentioned they are Nine Classics. The *Tso Chuan* is not, as has been wrongly believed, a commentary on the *Spring and Autumn Annals*, but a great book in its own right. Covering the years 722-468 BC, it was the first authentic, detailed hist. of 19 Chinese states, great and small, recounting in chronological order wars and diplomacy, court intrigues and love affairs, in a quarter of a million words. Its style is terse and vigorous, often lightened with piquant dialogues that gleam with the grandeur of Gk tragedies. Of the so-called *Four Books*, the first 2, the *Great Learning* and the *Doctrine of the Mean*, are in fact 2 chapters from the *Record of Rites*; the third, the *Analects*, a compendium in 20 books of anecdotes and sayings of Confucius, and dialogues between him and his disciples on philosophy, ethics, and gov. recorded by his disciples shortly after his death, is the most reliable source of information about the sage and his school of thought which shaped the Chinese national character in the past. The last, *Mencius*, a political philosophy of Mencius (372-289 BC), a member of the Confucian school, is remarkable for the writer's Socratic irony and Horatian eloquence in refuting the theories of the

rival schools which, in the preceding cent., had gained ascendancy at the expense of the Confucians.

The 'Hundred Schools of Thought.' Eminent among the 'Hundred Schools of Thought' were the Taoist, the Mohist, the Logicians, and the Legalist. The Taoist school may be represented by 2 books: first, the *Tao Te Ching* or *The Way and Its Power*, which has often been trans. into W. languages (the best trans. is by A. Waley), is a treatise of recondite naturalistic philosophy in verse. Secondly, the *Chuang Tzu*, by Chuang Chou (369-286 BC), who could not tell whether he once dreamed of being transformed into a butterfly or whether it was a butterfly that dreamed of being transformed into a human being, i.e. himself, is perhaps the most beautiful poetry in any prose literature—indeed the language he wielded seems to be inadequate to express the profundity of his thought. The *Mo Tzu* of the Mohist school, founded by Mo Ti (c. 479-381 BC), is in 2 parts: the first part contains popular essays on universal love, pacifism, altruism, frugality, etc.; the second part, the *Mohist Canons*, lays down postulates and propositions in logic and epistemology and deals with such sciences as optics, mechanics, metallurgy, etc. A sect of the Mohists developed into the School of Logicians, whose hair-splitting arguments earned them the sobriquet 'sophists.' Shang Yang (d. 338 BC), the exponent of the Legalists, bequeathed the Chinese his masterpiece the *Book of Lord Shang*, a dissertation on political economy; he put his theories into practice in the state of Ch'in and made her the greatest power of his time. The rational philosopher and master of prose Hsin Ch'ing (339-247 BC), the Aristotle of China, was the first to synthesise and expound Confucian philosophy with insight and penetration in his carefully planned and systematically organised book, the *Hsin Tzu*. Two of Hsin Ch'ing's disciples, Han Fei (d. 233 BC) and Li Shü (d. 208 BC), however, reverted to the Legalist school. The former's book, *Han Fei Tzu*, is the best work in this school, while the latter, who later became the Premier of the Ch'in Empire (221 BC).

If not the legitimate, father of the ruthless First Emperor (Ch'in Shih Hwang-ti), was the editor of the *Li-Shih Ch'un-chiu*, a symposium of many schools of philosophy in 26 books, pub. in 239 BC.

The poet *Chü Yüan* and his influence. The greatest poet before the Christian era was Chü Yüan (340-278 BC), b. in the Yangtze valley in the state of Ch'u, a member of the royal house, a secretary to the king and sometime an ambas. to Ch'i, in N. China. His unfettered imagination, variegated similes, passionate expressions, and elegiac style as illustrated in his best works, *The Lament*, *Queries put to Heaven*, and the *Nine Chapters*, are entirely different from the style of the *Book of Songs*; but above all he is best loved for his noble patriotic feeling that permeates every line of his work. His name has become

synonymous with the *Ch'u Tzu* or *Songs of the Ch'u People*, and his work was so loved by the emperors and writers of the Han Dynasty (206 BC-AD 195) that most of them wrote in this 'Tzu-fu' genre, which later developed into 'poetic essays' of prodigious length on such topics as *The Great Man*, *The Imperial Park*, *Mr Nobody* by the romantic poet Szu-ma Hsiang-ju (d. 118 BC); *Lament on the Death of Lady Li* by Emperor Wu (157-87 BC); *The Sweet Fountain* and *The Royal Hunting* by the mystic philosopher Yang Hsiung (53 BC-AD 18); and *The Two Capitals* by the mathematician Chang Heng (AD 78-139). On the other hand, folk-songs of every prov. of the Han Empire were officially collected and encouraged by the *Yao Fu* or the Bureau of Music which was estab. in 133 BC, and ever since lyric and narrative poems of that popular type have been known as *yao-fu* poems. It was this genre that laid the foundation of the later 5-word metres which broke the stylistic bounds of both the *Book of Songs* and the *Songs of the Ch'u People* and opened up new fields for further cultivation.

Historians of the Han Dynasty. The great pride of the four-cent. Han Dynasty, however, is the work on hist., of which Szu-ma Ch'ien's (b. 145 BC) *Shih Chi* or *Historical Record* is the crown of the 26 dynastic histories of China. This 'Herodotus of China' was the son of a Taoist historian, Szu-ma T'an, whose premature death moved the boy to undertake his father's ambitious project of writing a complete hist. of China from the earliest times to his own, a work destined to be the model of subsequent dynastic hist. of all ages. This masterpiece of over one million words is divided into 5 parts: its 12 chapters of *Dynastic Annals* are followed by 10 chapters of *Chronological Tables* synchronising events in different states in ant. China, and 8 *Dissertations* on rites, music, astronomy, irrigation, etc. These are followed by 30 hist. of *Hereditary Houses* of nobles of various states, including the family hist. of 'the uncrowned king' Confucius, and 70 *Associated Biographies* of all sorts of people, not excluding assassins, humorists, or even fortune-tellers. In his fluent enchanting style there is unity in variety, and with his powers of characterisation the biographies are as interesting as any of the best modern short stories. The second great work is the *History of the Former Han Dynasty*, another collective work of a learned family, in which the father Pan Piao set out the project, the daughter Pan Chao contributed some chapters, and the son Pan Ku (AD 32-92) executed the main task of 100 chapters (one of which in Dubs' Eng. trans. runs into 500 pages). As a writer Pan is less fluent but more concise than Szu-ma; as an historian he is less imaginative but more scientific and exact. Apart from many political pamphleteers, the sceptical philosopher Wang Ch'ung (d. AD 97) by his revolutionary *Lun Heng* or *Balanced Criticism* helped to undermine the authority of Confucianism that had dominated the thinking *literati* since

136 BC, when 5 chairs of Confucian Classics were created in the Imperial Academy by Emperor Wu. The great etymological dictionary *Shuo-wen Chieh-tzu* by Hsu Shen (2nd cent.) remains to this day an indispensable tool for Chinese studies.

Poetry, poetic essays, and parallel prose. The end of the Han Dynasty was marked by the introduction of Buddhism into China and the thriving of individualistic poetry, notably that of the Chien An school founded by Prince Ts'ao Chih (192-232) and his friends. In the following Wei and Chin Dynasties mysticism and metaphysics dominated C. L., including poetry, the best writers of which were the 'Seven Worthies of the Bamboo Grove,' with the great thinker Yuan Chi (210-63) as their leader. When mysticism gave way to the love of nature and freedom there emerged the peasant poet T'ao Ch'ien (365-427), who preferred farming to bowing to a high official. With profound but mellow feelings expressed in plain, simple language, T'ao's poems resemble those of Burns and Wordsworth. Folk-songs in the S. Dynasties (222-588) are mostly charming love ditties and descriptions of natural beauty. After the 3rd cent. poetic essays took a new turn and became shorter and more musical. Luh Chi's *Poetic Essay on Literature*, which was written in 281 when he was 20, is strikingly similar to Pope's *Essay on Criticism*. In prose, undue stress laid on the importance of balanced couplets gave rise to 'parallel prose' in which the 2 lines in each couplet are antithetically balanced, not only in the meaning but also in the tonal value of each word. The first systematic work of literary criticism, the *Wen-hsin T'iao-lung* or *A Literary Mind Carves the Dragon*, in 50 chapters, by Liu Hsieh, a Cantonese monk of the 6th cent., is written in this difficult but sonorous style. Meanwhile thousands of vols. of Buddhist literature were being trans. into Chinese, which, after the destruction of most of the original works in India, has become the chief repository of Buddhist writings in the world.

The Golden Age of Chinese poetry. The Tang Dynasty (618-907), known as the Golden Age of Chinese poetry, bequeathed to the Chinese the works of 2000 poets, ranging from emperors and scholars to peasants, monks, and courtesans. The 2 most distinguished were Li Po (701-62) the Taoist and Tu Fu (712-70) the Confucian. The Tang poets benefited by a legacy from their predecessors of many new devices and techniques in prosody as well as a great variety of styles and types of poetry. Li Po, however, was great enough to set aside all his predecessors by creating a new world with his unbridled imagination and bursting vitality. His work is characterised by a fairy-tale beauty unattained by other poets. His friend Tu Fu was versed in every type of poetry, paid meticulous attention to rules of prosody, yet wrote with ease as if there were no rules at all. His loyalty to the sovereign, love of the people, and patriotic feelings compelled him ruthlessly to expose the misrule of the gov. and the misery

of the people. His work has rightly been regarded as 'history written in poetry.' The painter and Buddhist Wang Wei (699-759) belonged to the peasant-poet school and some of his best poems were written before he was 20. The young poet Li Ho (790-816) was a Chinese Keats in his sheer ability to create sensuous beauty. The popular poet Po Chü-i (771-846) advocated a new school of didactic poetry, for the people and of the people. His outspoken criticism of gov. policy in verse was as widely circulated as modern newspapers. Yet his best achievement is to be found in his less didactic work such as the *Everlasting Sorrow* and the *Song of the Guller* (trans. Giles). Outstanding as romantic poets were Tu Mu (803-52) and Li Shang-yin (813-58), whose pensive love poems move lovers of all ages. The leader of the literary reform movement, Han Yü (769-824), was a great master of prose whose chief concern was 'to get rid of clichés' in the parallel prose of the past 8 dynasties. His friend Liu Tsung-yuan (773-859) excelled in the description of natural scenery. Short stories or romances, often dealing with fairy-tales and with love-stories, showed considerable development in T'ang times.

The Versatile Writers of the Sung Dynasty. In the short-lived Five Dynasties (907-959) and the following Sung Dynasty (960-1279) a new type of verse, the *tsü* or irregular metres, dominated the realm of the muse. At first these were love-songs, written or improvised to be sung by court girls at entertainments, but when later men of letters took a hand in writing such songs their scope was enlarged to include all subject-matter. As the songs were to be accompanied by music, the prosody was even more rigid than that of T'ang poetry, but this difficult task was eased by the introduction of vernacular expressions and rhymes. Best writers of this genre were Li Yü (937-78), Emperor of the S. T'ang Dynasty, whose love ditties cost him a kingdom; Yen Ch'u (991-1055) and his youngest son Yen Ch'iao, whose improvised songs often reach the height of majestic beauty; Liu Yung (990-1050), who preferred poetry writing to high office and whose poems were 'sung in every place where people drink water from the well'; Su Shih (Tung-p'o, 1036-1101), the most versatile writer of the time, who 'broke all the bounds of irregular metres'; and Chou Pang-yen (1057-1121), the president of the Royal Institute of Music, whose style and technique are considered the best. Hsin Ch'i-shi (1140-1207), a guerrilla leader who fought his way back to S. China from Shantung under the Golden Tartars, founded a new school of irregular metres by raising the lyrics to a height of epic grandeur. Classical poets of this period were Su Shih, Huang T'ing-chien (1045-1105), and their followers, whose refreshingly new styles earned for their works the celebrated designation 'Sung poetry' in contradistinction to 'T'ang poetry.' Among prose writers were the historians Ou-yang Hsiu (1007-70), compiler of

the *New History of the T'ang Dynasty* and *New History of the Five Dynasties*, and Szu-ma Kuang (1018-86) who spent 19 years in writing his *General Mirror Aid for Governing*, which chronicles and discusses events of 1362 years in about a hundred vols. There were also the economist and reformer Wang An-shih (1021-86); the essayists Su Shih, his father Su Hsün (1009-86), and his brother Su Che; and the philosopher and educationist Chu Hsi (1130-1200), whose neo-Confucianism influenced China for nearly 800 years. Vernacular short stories made their first appearance in the 11th and 12th cents., and the texts of the synopses of the story-tellers in the tea-houses later became the prototypes of Chinese historical novels, of which the *Romance of the Three Kingdoms*, rewritten by Lo Kuan-chung, was the most popular. Drama also flourished in S. China under Sung and in the N. under the Golden Tartars.

Drama in the Yuan Dynasty. In the Yuan (Mongol) Dynasty (1277-1367) scholars were looked down upon by their conquerors and men of talent devoted themselves to artistic creation. Poetic plays flourished on the Yuan stages; they were mostly in 4 or 5 acts, composed of narrative songs derived from the irregular metres, but with little dialogue. They were the direct offspring of the 'southern play' from the Sung Dynasty, with themes taken from Chinese hist., popular romances of T'ang and Sung, and occasionally from a Buddhist source but given a Chinese twist: e.g. Chi Chün-hsiang's *The Orphan of the Chao Family*, the best known of these plays in the W., was a famous story from the state of Chín (600 BC) recorded in the *Tao Chuan*; Wang Shih-fu's *The West Chamber* was based on a love-story by the T'ang poet Yuan Cheng; Li Hsing-tao's *The Chalk Circle* was a popular Sung legend. Other eminent authors among the 146 Yuan playwrights were Kuan Han-ch'ing, out of whose 60 odd plays there are 17 extant, and Ma Chih-yuan, whose 13 masterpieces were compared by his contemporary critics to the 'singing of a phoenix in the morning sunshine.' In the Ming Dynasty (1368-1662) there was a revival of the 'southern play' with elaborated plot, more refined verse, and many more acts for each play. *The Story of the Guitar* by Kao Tsé-cheng of the 14th cent., an ethical play in praise of patriotism, filial piety, and wifely forbearance, and *The Peony Pavilion* by T'ang Hsien-tsu (1550-1617), are the best and incidentally the longest of this kind of drama. The tradition of writing long plays was carried on to the early Ch'ing (Manchu) Dynasty (1644-1911), in which K'ung Shang-jen (1648-1718) dramatised the fall of the Ming Dynasty with an intriguing love-story in his *Peach Blossom Fan*, and Hung Sheng (1646-1704) immortalised the tragedy of the T'ang Emperor Ming-Huang and his sweetheart Yang Kuei-fei in his poetic play *The Palace of Eternal Youth* (trans. Yang Hsien-yi).

Novels since the fifteenth century. The 15th-cent. novel *Pilgrimage to the West*,

supposed to be the story of Hsüan Chuang's journey to India in search for Buddhist sutras, by Wu Cheng-en, is a combination of *Pilgrim's Progress* and *Gulliver's Travels* with incisive sarcasm on human frailties (there is an abbreviated trans. by Waley called *The Monkey*). *The Water Margin* (trans. P. S. Buck), a lengthy novel about the life of 108 Chinese 'Robin Hoods' by Shi Nei-an, is in fact a rewritten text of popular legends once told in the tea-houses. The remarkable social novel *Chin P'ing Mei* is a merciless exposure of the corrupt, erotic life in the decadent 16th cent. by an anonymous author. The greatest among all Chinese novels, however, is *The Red Chamber Dream* (there is an abbreviated trans. by Wang Chi-chen) by Ts'ao Chan (Hsüeh-ch'in, 1715-64), of about 2500 pages, a tragedy of the first magnitude comprising some 400, mostly female, characters; the characterisation is such that any one of them is unmistakably distinct from the others. It gives a panoramic picture of upper class social life in a Peking family, from its zenith of prosperity to its decline, with a passionate but unsuccessful love-story as its central theme. Its perfectly natural and realistic development of plot and psychological analysis of the characters are unrivalled in any literature. A totally different novel, *The Unofficial History of the Literati* (trans. Yang Hsien-yi, *The Scholars*), by Wu Ching-tzu (1701-54), is a most powerful satire on vices of the examination system, concubinage, self-immolation, superstition, and, above all, hypocrisy and vanity. Its style is so realistic that it appears as if the author's sympathies were with the characters he ridicules. Vernacular short stories were written and collected in the 17th cent. by Feng Meng-lung, and the best extant are those in the *Wonderful Tales Ancient and Modern* (a part trans. as *The Courtesan's Jewel Box*). Fairytales in the classical Chinese language have been written ever since the 6th cent., but the best and the most voluminous writer of these was P'u Sung-ling (1640-1715), whose *Liao-chai Chih-i* contains 431 stories (164 of which were trans. by Giles in *Strange Stories from a Chinese Studio*), and in 1938 another 56 by him were discovered. His vernacular novel *Hsing-shih Yin-yuan*, or *Strange Marriages*, is less popular.

Researches in classics under foreign rule. In the early Ch'ing Dynasty the number of Chinese scholars executed on account of their hostile literary works far exceeded those killed by the First Emperor in 212 BC, and the collecting of books to furnish the 79,339 vols. of the *Szu-k'u Ch'uan-shu* or *Complete Collection of the Four Treasures* by Emperor Chien-lung, 1762, had served the double purpose of eliminating books containing Chinese nationalist elements directed against the Manchus, and encouraging researches in ancient classics so that the minds of Chinese scholars could be turned away from dangerous political thoughts. As a result the Chinese sought refuge in researches in philology, phonetics, textual criticism, historiography,

geography, etc., which laid the foundation of truly scientific scholarship in classical studies. Their original works numbered over 3000 vols. in the 2 collections of *Ching Chieh* or *Studies in Classics* up to the end of the last cent. Local hist. of every one of the more than 2000 cos. in the whole country was compiled and revised from time to time, in addition to prefectural (*fu*) and prov. hist. Since the 4th May Movement in 1919 a very considerable amount of new literature in the vernacular has been produced. The best and most beloved writer was Lu Hsin (Chou Shu-jen, 1880-1936), the Chinese Gorky, whose *True Story of Ah Q* and other stories have been trans. into most W. languages.

Bibliography. J. Legge, *The Chinese Classics* (5 vols.), 1861-72; *The Texts of Taoism*, 1891, and *Sacred Books of the East* (vols. xxxix and xl); E. Chavannes, *Les Mémoires historiques de Se-Ma Ts'ien* (5 vols.), 1895-1905; H. A. Giles, *Chinese Poetry in English Verse*, 1896, and *A History of Chinese Literature*, 1901; A. Waley, *A Hundred and Seventy Chinese Poems*, 1918, and *More Translations from the Chinese*, 1919; S. Obata, *Translation of Li Po*, 1922; B. Brown, *Chinese Nights' Entertainment: Stories of Old China*, 1922; E. B. Howell, *The Inconsistency of Madame Chuang, and other Stories from the Chinese*, 1924; H. II. Dubs, *Hsin Tzu the Moulder of Ancient Confucianism*, 1927, and *History of the Former Han Dynasty* (3 vols.), 1938-55; J. J. L. Duyvendak, *The Book of the Lord Shang*, 1928; Mei Yi-pao, *The Ethical and Political Works of Mo Tzu*, 1929; L. C. Arlington, *The Chinese Drama from the Earliest Times until To-day* (with synopsis of 30 plays), 1930; L. C. Arlington and H. Acton (trans. and ed.), *Famous Chinese Plays*, 1937; Feng Yu-lan, *A History of Chinese Philosophy* (2 vols.) (trans. D. Bodde), 1937-53; P. S. Buck, *The Chinese Novel*, 1939; W. Eberhard, *Chinese Fairy Tales and Folk Tales*, 1941; E. R. Hughes, *Chinese Philosophy in Classical Times*, 1942; Lin Yu-tang, *The Wisdom of China*, 1949; Mao Tun (editor), *Chinese Literature* (quarterly), 1953 et seq.

Chinese Pottery. It is to China that we owe sev. of the distinctive features of artistic pottery. The development of ceramics seems to have followed the same lines as elsewhere in the early stages, though the Chinese appear to have been the first to discover that powdered felspathic rock mixed with lime could give a high glaze. The earliest crude porcelain has been discovered from tombs of the 1st cent. Chinese potters favoured high temp. firing, which resulted in a highly vitrified stoneware. The discovery of the properties of kaolin appears to have led to the production of the thin translucent ware known as porcelain about AD 1000. Owing to the high temp. of firing, the Chinese were restricted to such colours as cobalt blue and a blood-red copper pigment in their decorative schemes. Afterwards other colours were painted after the blue and red had been fixed and the ware fired again at a lower

temp. The influence of Chinese porcelain cannot be over-estimated. *See also* POTTERY.

Chinese White, condensed form of the pigment known as zinc white. This is an oxide of zinc (ZnO) which is manuf. by combining vaporised metallic zinc with air, when the pigment is deposited as a white powder. C. W. is not liable to chemical or physical change, and is practically inert with regard to other pigments. It forms an excellent opaque water-colour, but lacks toughness with oil.

Chinese Wood Oil, *see* TUNG OIL.

Chingcheng, or Tsinchow, tn of Shan-tung prov. in N. China, 80 m. NE. of Tsinan. The former cap. of the prov. and a centre of the silk trade.

Chingchou, tn of Hupeh prov., China, near Shashi.

Chingford, suburb of London in Essex, England, situated between the R. Lea and Epping Forest, 10 m. from London. Pop. 49,000.

Chingleput, tn in Madras state, India, 35 m. S. of Madras. It has a fine Hindu Fort, built about AD 1565, which was the scene of fighting between the British and French in the time of Clive (1751-2), and later between the British and Hyder Ali.

Chingola, tn of N. Rhodesia, on the Copperbelt, estab. 1940 around the Nchanga copper-mine. Pop.: Europeans, 4000; Africans, 30,000.

Chingsha, or Kinshakiang (riv. of golden sand), Chinese name for the upper course of the Yangtszekiang, rising in the mts of the Kunlun system, dividing the prov. of Sikang. It is separated by mts from the R.s. Hwang Ho and Mekong.

Chingtehoben, or Fuliang, tn of China in the prov. of Kiangsi, on the R. Ch'ang. Famed for its porcelain, which was made here before AD 1000, the industry declined from 1920 onwards, and has been revived only since 1951. The Kaoling hills in the dist. have given the name to kaolin (q.v.) or china clay, used in the manuf. of porcelain. Pop. 600,000.

Chingtzukuan, tn of Honan, China, on the T'ang R., of considerable commercial importance, being at the head of winter navigation on the riv. and on the Hankow to Sianfu trade route.

Chin-India, *see* INDO-CHINA.

Chinkiang, *see* CH'ANGCHOW.

Chinlin Mountains, branch of the Kunlun Mts in China, dividing the Wei and Han R.s. in their upper courses. Its highest peaks are in the Tapishan and Kwangtangshan, both upwards of 12,000 ft high. This range has sev. important passes, of which the chief are those connecting Sian and Shangchow with Lunchow and Fengsiang with Kuang-yuan.

Chinnampo, port in Korea, 40 m. from Pyongyang, has a pop. of 30,000. Rice, beans, wheat, cow-hides, and timber are exported.

Chino-Japanese War (1894-5), *see* SINO-JAPANESE WAR.

Chinon, Fr. tn, cap. of an arron., in the dept. of Indre-et-Loire, on the Vienne. Clovis I (q.v.) took it from the Visigoths.

In the Middle Ages it belonged to the Plantagenets (q.v.), but was lost to Philip II of France (q.v.) by Henry II of England who d. here. On a hill above the tn are the ruins of an immense stronghold, which is really 3 castles in 1. One of these castles was built by Henry II, and in another Joan of Arc (q.v.) informed the Dauphin of her mission. There are 3 remarkable churches, one of which is partly 11th cent. Rabelais (q.v.) was b. here. Pop. 6100.

Chinook, name applied to a warm SW. wind which blows from the Pacific over S. Brit. Columbia. It is a local wind similar to the *Föhn* of the Alpine valleys and is due to a cyclone passing northwards. The name was first applied because this wind blew from the neighbouring C. camp over Fort George (Astoria), at the mouth of the Columbia R. Under its influence, the snow melts with astonishing rapidity, and the weather soon becomes springlike. It is felt as a cool wind in summer.

Chinooks, aboriginal tribe of Amer. Indians living in the extreme NW. of the U.S.A. The tribe is now nearly extinct. The C. were formerly great traders, bartering with the interior tribes the articles they obtained from the white skippers. The useful 'Chinook jargon' came into being as a means of communication rendered necessary by this commerce.

Chinquapin, or *Castanea pumila*, Amer. species of Fagaceae closely allied to the chestnut. The plant is of shrubby habit, and the nuts are edible.

Chinsura, formerly a tn in W. Bengal state, India, now forming one municipality with Hugli, 24 m. from Calcutta. It is the seat of Hugli College. From 1656 to 1824 the chief Dutch settlement in Bengal, ceded to the English with other places in exchange for possessions in Sumatra Ia.

Chintz (Hindu *cint*; Bengali *chī*, from Sanskrit *chitra*, spotted, variegated), originally the name of pieces of printed calico or cotton fabric from India, each piece being a 'chint.' The name was later applied to a highly glazed, printed calico of home manuf., with a many-coloured pattern of flowers or birds on a light background. C. is used for curtains, furniture coverings, etc. Dust does not adhere to its calendered surface. See also CRETONNE.

Chinwangtao, modern treaty port of China on the Gulf of Chihli. The port, which is ice free, has a tidy and busy appearance. In recent years C. has become an important port for Manchurian products, especially soya-beans. Some 11,000 persons are employed by the port administration. Pop. 20,000.

Chicoeca, genus of Rubiaceae which consists of seven evergreen shrubs of tropical America. The root of sev. of these plants has emetic properties, and *C. angustifolia* is used by the natives as a remedy for snake-bites. *C. racemosa* is the fragrant Snowberry.

Chioggia (anc. *Foasa Clodia*; later *Clugia*), lt. tn, in Veneto (q.v.), built on an is. at the S. end of the Venetian lagoon,

15 m. SSW. of Venice (q.v.). Near the tn, in 1379, the Venetians decisively defeated the Genoese fleet. It is connected with the mainland by a bridge, and is intersected by 3 canals. There are many curious old buildings, including sev. fine churches. The cathedral dates from the 17th cent. C. is a busy fishing port, and has manufs. of lace, sails, candles, and bricks. Pop. 41,000.

Chionea, genus of Diptera in the family Tipulidae, has sev. peculiar features, and the species are destitute of wings. *C. araneoides* has been found in the woods of Sweden and the mts of Austria when both were covered with snow, the insect showing itself only in cold weather.

Chios, Gk is. and port in the Aegean Sea, 8 m. off the W. coast of Asia Minor at the entrance to the Gulf of Smyrna. It is 32 m. long, varies in breadth from 8 to 15 m. and has an area of 320 sq. m. Pop. 66,800. The scenery is very striking. Grapes, oranges and lemons, figs, olives, aniseed, and tobacco are grown. Mastic or gum resin is a noted product. C. was the home of the school of epic poets called Homeridae, whose task it was to hand down the Homeric text. Voliso (formerly Bolissus), the tn in which these poets lived, is still extant. C. is famed for its sculptors and the long succession of Chian sculptors in marble testifies to the fame of Chian art in the 7th to 6th cents. bc.

Six m. N. of the tn of C. is a curious monument of antiquity called 'the school of Homer'; it is an anct. sanctuary and altar built to the goddess Cybele, whose statue, with 2 lions, is chiselled in the rock. At Cape Phanae, the S. extremity of the is., is a harbour and the remains of a temple of Apollo. C., the cap. of the is., is on the E. coast. It has a harbour, a cathedral, and a 13th-cent. castle. It is one of the busiest ports of the Gk is. Pop. 24,400.

This hist. of C. is most obscure and the early relations of the is. with other states conjectural. It was settled by Ionian colonists about the end of the Bronze Age. The Chians, however, were allies of Miletus and hostile to the Phocaeo-Samian alliance, to which the neighbouring Erythrae belonged. The Chians took part in the Ionian rebellion against the Persians (500-495 bc) and supplied 100 ships. After the Persian victory at the battle of Lade, C. was unmercifully treated, the tns and temples razed and many inhab. sent into slavery. After the battle of Mycale (479 bc) the is. became free with a democratic form of gov., in place of the tyranny. C. was the strongest state after Athens in the Delian confederacy and it was an ally, on an equal footing, of the Athenian empire, tribute-free but supplying ships in time of war. Later the Chians joined the Lacedaemonians but, though their fleet was defeated at Bolissus and in 2 other battles, the Athenians could not conquer the is. In the Mithridatic wars C. leaned to alliance with Rome but, following defeat, a large number of the Chians were carried to slavery in Pontus. C. had, however, many cents. of peace and prosperity under both Rom. and Byzantine

rule. A Genoese chartered company held the is. from the 14th cent. to 1566 when the Turks took it and, except for a brief occupation by the Venetians in 1694, it remained in Turkish possession until the First World War when it became a Gk is. Under the Turks C. was almost wholly self-governing but in 1822 a revolt was punished by a savage massacre. In 1881 the is. was devastated by an earthquake, in which some 5000 people perished. The Chians are traditionally republican in politics. It was in C. in 1922 that the revolt began which led to the fall of King Constantine.

Chipmunk, or *Tamias striatus*, species of ground squirrel common to N. America, and belongs to the family Sciuridae. It is a pretty creature, differing from the common squirrel chiefly in having large cheek-pouches and a shorter tail. Its diet is strictly vegetarian.

Chippendale, Thomas (c. 1718-79), famous cabinet-maker and upholsterer of the 18th cent. He came to London from Worcester with his father, a well-known cabinet-maker and wood-carver, and ultimately estab. himself with his factory in St Martin's Lane. C.'s work is characterised by solidity without heaviness; his ribbon-backed chairs are perhaps his most successful work, and next to these his settees of 2 or 3 conjoined chairs. His designs were influenced by the architect, Robert Adam, and by a varied taste for Chinese, Gothic, and Fr. patterns, but in adapting them he showed the talent of an artist. He pub. *The Gentleman and Cabinet Makers' Director*, containing his own designs and descriptions, and had a host of imitators. See R. W. Symonds, *Chippendale Furniture Designs*, 1948.

Chippenhams, tn in Wilts, England, the point of intersection of 4 'A' roads, 12½ m. from Bath and 22 m. from Bristol. The R. Avon is crossed here by a bridge having 21 arches. The tn has weekly corn and cattle markets, the latter in modern premises. There is also a general goods market held every Friday. Railway brakes and signals, also rectifiers, are manuf. here and it has bacon-curing factories, a tannery, and milk-processing plants. It used to be a centre for the making of broadcloth. It is stated that Ludovic Muggleton, the founder of the Muggletonians, was b. here. The tn is of historical interest, being formerly occupied by the Saxon kings in Wessex, and King Alfred was forced to flee from the tn when surprised by the Danes. Sev. battles were fought in the neighbourhood during the Great Rebellion. Pop. 15,000.

Chippewayans, numerous tribe of Amer. Indians of the Algonquian linguistic stock, now settled in U.S.A. and Canada in the region of the Great Lakes. They are also called Ojibwa. They number about 35,000, of whom about half are in Canada. They fish, hunt, gather wild rice and cranberries, manuf. maple sugar, weave baskets and mats, and prepare birch bark for canoes, etc. Most of the stories quoted in Longfellow's *Hiawatha* are from the C.

Chipping Campden, mrkt tn in Glos.,

England, 9 m. from Evesham, formerly a thriving centre of the woollen industry. In 1933 land was bought by the Pilgrim Trust to preserve the surroundings of the fine Perpendicular church and of Old Campden House. Pop. 1800.

Chipping Norton, mrkt tn and municipal bor. (charter of James I) of Oxon., England, 19 m. N. of Oxford. C. has a fine Gothic church, almshouses (1640), a 16th-cent. Guildhall, and other buildings of architectural and historic interest. Near by are the Rollright Stones (see ROLLRIGHT, GREAT AND LITTLE). Tweed is manuf.; there is a brewing industry and an agric. trade. Pop. 3900.

Chipping Sodbury, small mrkt tn of Glos., England, 11 m. NE. of Bristol and administrative centre of the rural dist. of Sodbury. Pop. (tn) 1800; (rural dist.) 37,850.

Chipping Wycombe, see WYCOMBE.

Chiquishequi Palm, or *Leopoldinia piassaba*, Brazilian palm noted for the good fibre obtained from its bast. The piassaba fibre is used in brush-making and the leaves in thatching.

Chiquimula: 1. E. dept of Guatemala, largely agric., with stock-raising and sugarcane, coffee, tobacco, etc. Area 917 sq. m; pop. 112,300.

2. Cap. of above, colonial city, 65 m. from Guatemala on the Salvador branch of International Railways. The ruins of C. Antigua, destroyed by earthquake in 1773, are near. It has an active agric. trade. Pop. 8850.

3. Isthmus of Guatemala on Caribbean Sea, between the Motagua and the Dulce on Honduras Bay.

Chiquinquira, city of Boyacá dept, Colombia, 91 m. from Bogotá on W. bank of Suárez R.; altitude 8365 ft. Noted for its miraculous picture of Our Lady of C., annually visited by thousands of pilgrims. Every seventh year there is a special public celebration. It has an airport and is a commercial centre, marketing coffee and cattle. Pop. 7000.

Chiquitos, group of Amer. Indian tribes dwelling in Bolivia. They are well built, powerful, and of middle height, with bronzo complexions. They are hospitable, kindly, cheerful, and fond of music and dancing. They live in vills, founded by Jesuit missionaries, whom they willingly received in 1691, and who rapidly converted and civilised them. Since the expulsion of the Jesuits in 1767 they have degenerated considerably. They number about 20,000, and live in adobe houses thatched with grass; they are principally engaged in weaving ponchos (a kind of blanket cloak) and hammocks, manufacturing copper boilers for sugar making, and straw hats.

Chira, or **Cheera**, tn of Sinkiang, China, 50 m. E. of Khotan. The Gobi Desert skirts it about 3 m. to the N. Pop. about 40,000.

Chirata, *Swertia* (synonym *Ophelia chirata*, an annual of the Gentianaceae, grown in N. India; gathered and dried for its bitter, stimulant, and tonic properties, due to content of chiratin, the active bitter principle, and ophelic acid.

Chirchik, tn NE. of Tashkent in Uzbek S.S.R. of Soviet Union. It is a centre of the chemical industry and has a large hydro-electric plant. Pop. 60,000.

Chiriqui, prov., riv., lagoon, and archipelago of Central America, in W. Panama. The riv. flows into the Gulf of C. on the Pacific; it is not navigable, and shares a delta with the David R. The lagoon is an inlet of the Caribbean Sea separated from it by the archipelago. It has 3 entrances, Boca del Drago, del Toro (on each side of Isla del Drago) in NW., Boca del Tigre on E., and is navigable for the largest ships. It extends 90 m. along the coast, and 40 m. inland. The prov. has lofty volcanic peaks (C., 11,410 ft) and a fertile soil. Tobacco, sugarcane, and bananas are grown. Cap., David. Area 3693 sq. m.; pop. about 137,400 (20 per cent Indian).

Chirk, par. and vil. in Denbighshire, 9 m. from Wrexham, on the W. Region railway. Has a famous castle, the home of the Myddelton family. The original castle was built in the 11th cent., the later, a 14th-cent. building, being restored in the 17th cent. In the vicinity are collieries. Pop. 3100.

Chironomy, see PALMISTRY.

Chromo, vil. and trading-port of Nyasaland Protectorate, at confluence of R. Shire and Ruo, 55 m. from Blantyre. The Shire Highlands railway here crosses the Shire.

Chironomys Madagascariensis, see AYE-AYE.

Chiron one of the centaurs (q.v.), son of Cronos by the sea-nymph Phyllira. Instructed by Apollo and Artemis in hunting, medicine, music, gymnastic, and prophecy, he taught these arts to the most famous heroes of mythology. Accidentally wounded with a poisoned arrow by Heracles, he renounced his immortality in favour of Prometheus, and was placed by Zeus among the stars as Sagittarius.

Chironectes, water opossum or Yapock, genus of marsupials, is represented by one species which inhabits S. and Central America. It is about the size of a rat, has webbed hind feet, and feeds upon fish, water insects, and crustaceans.

Chironomus, chief genus of the midge and gnat family or Chironomidae, contains over 200 Brit. species. The perfect fly is 2-winged, and the blood-red larva is often called a blood-worm by anglers, who use it when fishing. It dwells in mud and forms food for birds and fishes. The swarms of little grey flies which dance actively above water on summer evenings belong to this genus.

Chiroptera, see BAT.

Chirotes Canaliculatus, worm-like lizard of the family Amphisbaenidae, forms in itself a genus, and bears the distinction, wanting in all its relations, of possessing 2 small anterior limbs each with 2 toes. The C. is to be found in Mexico, and in length it varies from about 8 in. to 1 ft.

Chirpan, or Tohrpan, mrrkt tn of Bulgaria, in Stara Zagora (q.v.) prov., 23 m. SW. of Stara Zagora. Pop. 13,600.

Chiru (*Pantholops hodgsoni*), Tibetan species of antelope. The animal is pale

fawn in colour with coarse hair; the male alone has horns, and these are long, straight, ringed, and gazelle-like. It is nearly 3 ft in height, and is so swift and alert that great difficulty is experienced in its capture.

Chisel (M.E. *chisel* or *chesil*, from O.F. *cisel*), cutting tool with the blade at one end, driven with a thrusting action by hand or hammer. C.s differ widely in shape and purpose. The *cold C.* is used for cutting unheated metal and stone; it is formed of highly tempered steel, and is driven by a hammer. Stonemasons' C.s are bevelled on both sides and vary considerably in shape; the *boasting C.* is used for roughly dressing the surfaces of stones. Carpenters' C.s are driven by hand or by blows from a mallet. The ordinary implement is wooden - handled, and the blade is bevelled on one side only, the bevelled face meeting the flat side at an angle of about 20 degrees. The *carving C.* is one of the most delicate of these instruments. It is bevelled on both sides, and the 2 faces meet at an extremely acute angle, that it may lightly cut the wood without crushing it out of shape. The *spoon C.* is a bent instrument, bevelled on both sides, used by sculptors. Among other varieties may be named the dental C., the turning C., the mortise C., and the ripping C. Certain C.s, with semicircular blades used for gouging, are generally known as 'gouges'.

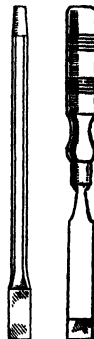
Chishima (Thousand Isles), Jap. name of the Kurile Is. (q.v.).

Chisholm, Alexander (c. 1792-1847), Scottish painter, early apprenticed to a weaver, went to Edinburgh about 1812, becoming teacher at the Royal Scottish Academy. He moved to London, 1818, exhibiting at the Royal Academy and the Water Colour Society. His main works were anecdotal and illustrative, e.g. 'Boys with a Burning Glass,' 1822, and 'Shakespeare before Sir Thomas Lucy,' 1834.

Chisholm, Hugh (1866-1924), editor, b. London, grandson of Henry C., private sec. to Lord Grenville, the Prime Minister. He was educ. at Felsted and Corpus Christi, Oxford, and was called to the Bar in 1892, but was already in journalism—as assistant editor of the *St James's Gazette*, of which he became editor in 1897. In 1900 he was engaged as joint editor, with Sir Donald Mackenzie Wallace and President Hadley of Yale, of the supplementary vols. of the *Ency. Brit.*, constituting the tenth ed. In 1903 he became editor-in-chief of the eleventh ed., and he also ed. the twelfth. From 1914 till March 1920 he was financial editor of *The Times*, resigning to edit the additional post-war vols. of the *Encyclopaedia*.

Chisnau, see KISHINEV.

Chislehurst forms, with Sidcup, an



CHISELS

urban dist. of Kent, England, 13 m. SE. of London by rail. It is delightfully situated on a common. At Camden Place, in the vicinity, Napoleon III. d. in 1873, and the Empress Eugénie lived here for some years with the Prince Imperial, to whose memory a cross has been erected on the common. There is a chain of interesting subterranean caves whose origin and use have not been fixed with certainty, but they are believed to be ancient storehouses and hiding-places. Pop. 35,290.

Chistopol', tn in the Tatar Autonomous Rep. (q.v.), on the Kama, 70 m. SE. of Kazan'. It is the centre of the Lower Kama agric. area. Pop. (1931) 15,500 (1901, 22,000; 1926, 17,500). It has been a town since 1781. Before 1917 there was a flourishing grain trade. Cap. of C. Oblast within Tatar Rep. 1952-3 (abolished).

Chiswick, Middx, suburb of London, on the N. bank of the Thames, 7 m. from St. Paul's. The name means 'cheese farm.' Since 1932 it has been joined with, and is the administrative centre of, the bor. of Brentford (q.v.). For long a riverside vil., its N. part, lying on the Great W. Road was rapidly developed in the later 19th cent. C. House, a remarkable Palladian villa, was designed by the 3rd Earl of Burlington for himself, c. 1725-7, the interior being decorated by Wm Kent. Hogarth's house, in which he lived from 1749 until his death in 1764, is now a museum of the painter's relics. Walpole House is probably the original of Miss Pinkerton's Academy in Thackeray's *Vanity Fair*. Charles Whittingham's famous C. Press li. here from 1816 to 1852. At Turnham Green, N. of the old parish, Charles I's forces turned back after capturing Brentford (1642). In the par. churchyard are the graves of Hogarth and Whistler (qq.v.). Industries include the manuf. of polishes and cosmetics, and light engineering. Pop. (with Brentford), 59,100.

Chita, tn of Boyacá dept, Colombia, 74 m. from Tunja, 150 from Bogotá. On W. of E. Cordillera at a height of 9859 ft, it produces wheat, potatoes, and maize. It has a salt mine and springs. Pop. 1000.

Chita: 1. Oblast in SE. Siberia, E. of Lake Baykal, a mountainous region largely covered with coniferous forests, with a continental climate (little precipitation, very severe winters). It has large deposits of gold, tin, other non-ferrous metals, iron, and coal. C. has dairy cattle and sheep breeding, spring grain growing, mining, engineering, and food industries. It is an area of banishment and labour camps. Area 168,200 sq. m.; pop. (1956) 1,009,000, mostly Russian (since 17th cent.), also Buryat and Evenki.

2. Cap., economic and cultural centre of the above, on the Trans-Siberian (q.v.). It has locomotive works, sawmills, and sheepskin and leather industries. It was a small Cossack fort. tn in the 18th cent., a place of banishment of Decembrists (q.v.) in 1827, and from 1851 the cap. of Transbaikalia and the seat of Nerchinsk

(q.v.) Mining Administration. From 1918 to 1920 it was the H.Q. of a White army, supported by the Japanese, and from 1920 to 1922 the cap. of the Far E. Rep. (q.v.). Pop. (1956) 162,000 (1897, 11,500; 1917, 44,000; 1939, 102,500).

Chita (animal), see **CHEETAH**.

Chitambo, vil. of N. Rhodesia, situated about 10 m. to the SE. of the S. shore of Lake Bangweulu. It is noted as the place where Livingstone d. in May 1873.

Chitin, skeletal substance found in all arthropods, forming most of their hard parts, and also in some other animals, e.g. the brachiopod *Lingula anatina*. It is a white, amorphous substance containing nitrogen, yields glucosamide in acids, and is insoluble in alkalis.

Chitonidae, family of molluscs, in the class Amphineura, consists of marine animals ranging in size from half an inch to half a foot; some are littoral and others have been dredged from greater depths. All the species are bilaterally symmetrical, have 8 shell-plates embedded partially or entirely in the mantle, are covered with spicules, have an anterior mouth and a median posterior anus. They live on vegetable matter, and in habit are like limpets; they usually attach themselves to rocks, but can crawl by means of their long foot, and are capable of rolling themselves up.

Chitor, tn in Rajasthan, in the former state of Udaipur. The fortress Chitorgarh is famous for its fanatical defence against Muslim invaders. Three times in its hist. the ruling prince led the defenders of the fort to total extermination while the women immolated themselves in sacrificial fire.

Chitral, state formerly constituting an agency of the NW. Frontier of India, now administered as an agency by the Gov. of Pakistan. The state has an area of about 4500 sq. m., and a pop. of 60,000. In 1885 the Lockhart mission visited C., and in 1889, and again in 1891, the Brit. Gov. agreed to pay the reigning *mehtar* a subsidy on condition that he accepted its advice as to foreign policy and defence. From 1895 to 1947 Great Britain exercised a protectorship over the state, and maintained a small force there, as it was an important Brit. outpost. The region is fertile and the climate cold.

Chittagong, tn in E. Bengal, Pakistan. It was originally in the Hindu kingdom of Tippera, but was captured by Moguls in 1688. C. has long been a useful port of call for coastal shipping and proved a valuable base for operations against the Japanese in Burma in 1943-4. It is now being rapidly developed as the chief port of E. Pakistan.

Chittagong Wood, large tropical tree, *Chickrassia tabularis*, family Meliaceae, also known as Indian red-wood, bastard cedar, and white cedar. It is largely used in cabinet making.

Chitty, Joseph (1776-1841), eminent special pleader and writer of *Treatise on Pleading*, 1809, *The Laws of Commerce and Manufactures and the Controls relating thereto*, 1820, and other books on law. His 3 sons, Thomas, Joseph the younger,

and Tompson, were also well-known lawyers and writers.

Chitty, Sir Joseph William (1829-99), son of Thomas C., was for 16 years a very popular judge. He became master of the rolls in 1881, and was promoted to the court of appeal in 1897; he wrote legal text-books.

Chiusa (Lat. *clausa*, shut in): 1. It. tn. in Trentino-Alto Adige (q.v.), 6 m. SW. of Bressanone (q.v.). It lies on a narrow strip of land (altitude 1678 ft) between a cliff and the R. Isarco, and is overlooked by an anct monastery.

2. (**Chiusa Scelafani**) Tn in Sicily (q.v.), 32 m. SSW. of Palermo (q.v.). Pop. 7000.

Chiusi (Etruscan Clusium), It. tn. in Tuscany (q.v.), 37 m. SE. of Siena (q.v.). It stands on a hillside near the lake of C. Anciently, it was one of the cities of the Etruscan Confederation (see ETRURIA), and it was the home of Porsena (q.v.). Near the tn there still exist vestiges of Etruscan fortresses, as well as grottoes or catacombs, which served as tombs and where were found the sun-dried black earthenware vases and other ornaments now in the museums of Florence and C.; the latter museum suffered severe losses during the Second World War. In the Middle Ages the tn was plagued by malaria from surrounding swamps—Dante calls it a 'pestilential pool'—but, as a result of drainage schemes, it is now the centre of a fertile agric. dist. It has a 10th-cent. cathedral (restored, 19th cent.). Pop. (tn) 3000; (com.) 8600.

Chivalry, or the system of knighthood, is closely bound up with the feudal system of Norman times. It has its roots, however, in Germanic times, as Tacitus shows in his account of this race. C. became further developed in the 11th cent., and the order of knighthood involved many duties and responsibilities. The king himself had to train for knighthood when he had to serve first as page, then as esquire, before being presented with the golden spurs which were one of the symbols of knighthood. Before a knight was admitted into his order, a vigil or night-watch was held by him in a chapel where he gave himself up to solemn meditation before assuming his new duties and privileges. C. was eminently social in its relations to feudalism, and assumed a deep spiritual significance in its relations to the crusade movement where the knight had to perform military service for the cause of Christianity against the infidel in Palestine. The favourite sport of C. was the tournament or joust, in which the knight sought to win his lady's favour. A tournament would occupy some 2 or 3 days. There would be a trial of combat between 2 knights, often with lances, and the victor, besides winning the armour and horses of the vanquished, would be permitted to name some lady who would preside over the remaining sports, and who was called the Queen of Love and Beauty. The idea of a love both spiritual and chivalrous became associated with the word C. in the Middle Ages. Here the love of a lady

implied a deep and reverent attachment to the whole of womanhood; at the same time one woman could be the particular object of the knight's thoughts, when the relationship was purely platonic. C. under these conditions gave rise to a vast library of literature, in which all kinds of romances, adventures, and poems were written. See also KNIGHTHOOD. See C. S. Lewis, *The Allegory of Love*, 1936.

Chivalry, Court of, military court estab. under Edward III, regulated by Richard II, 1390, of which the earl marshal and lord high constable were joint judges. Its function is to determine questions relating to armorial bearings. It tried no cases from 1937 until 1955 when it upheld the Manchester Corporation's claim that a certain theatre should not display the civic coat of arms. The Lord Chief Justice who sat with the earl marshal as his surrogate (q.v.) delivered judgment in which he held that the C. of C. was not obsolete. See Sir W. Blackstone, *Commentaries on the Laws of England*, 1765-8, and H. J. Stephen, *Commentaries on the Laws of England*, ed. of 1883.

Chivasso, It. tn., in Piedmont (q.v.) on the Po (q.v.). It is an important mkt and commercial tn, and has engineering and textile manufs. There are sulphur springs near by. Pop. 12,000.

Chive, Clive, or *Allium schoenoprasum*, a glaucous plant related to such well-known plants in culinary use as the leek, onion, and garlic. Like them, it grows in Britain, and the leaves are considered to be edible, their chief use being to flavour soups and stews. The C.s grow from bulbs, the leaves are long and narrow, and the flowers are bright purple or pinky in colour.

Chivilcoy, tn and cap. of C. dist., Buenos Aires prov., Argentine Rep., situated 95 m. WSW. of Buenos Aires. It is an agric. centre, and has dairying, flour-milling, meat-packing, and other industries. Pop. 23,000.

Chizerots, or **Burina**, name given in France to the debris of one of those despised races known under the general name of *Cagots* (q.v.). The C. are found in sev. of the coms. of Bourg, in the dept of Ain, being mostly cattle-dealers and butchers. Opinion is divided as to their origin, but they are said to be of Goth or Saracen blood, though it is possible that they really originated as a leper colony. In the Middle Ages they were the object of persecution and restrictions. Only with the Fr. Revolution were they allowed ordinary civil rights. See F. Michel, *Histoires des races maudites de la France et de l'Espagne*, 1947.

Chkalov (until 1938 **Orenburg**): 1. Oblast in Russia, S. of the Urals, on the border of Europe and Asia, largely fertile, level steppe; in the E. it includes the southernmost part of the Ural Mts. It has a dry continental climate. There are large iron ore, nickel, copper, and other non-ferrous metals, oil, and coal deposits. Spring wheat is grown, and cattle and sheep are bred for meat and milk. There are also engineering, metallurgical, oil refining, food, and other industries. The

prin. tns are C. and Orsk. Area 47,400 sq. m.; pop. (1956) 1,778,000, mostly Russian. Renamed Orenburg in 1957.

2. Cap., economic and cultural centre of the above, on the R. Ural. It has extensive engineering, flour, meat, leather, and clothing industries, and is an important transportation centre. C. was founded in 1735 (on the site of Orsk, transferred in 1743 to present site) as a fortress and centre of the Orenburg Fortified Line along the R. Ural, manned by Cossacks. Since 1744 it has been administrative centre of the S. Urals and the adjoining steppe areas, the main point of a large barter trade with the Kazakhs (q.v.), and the base of Russian advance into Central Asia. In 1918-19 it was a centre of anti-Bolshevism, and in 1920-4 cap. of the Kirghiz (Kazakh) Autonomous Rep. Pop. (1956) 226,000 (1897, 73,000; 1939, 173,000). Renamed Orenburg in 1957.

Chladni, Ernst Florens Friedrich (1756-1827), Ger. philosopher, founder of the science of acoustics. He was b. at Wittenberg, became doctor of laws and prof. of jurisprudence at Leipzig, but after some time abandoned law and gave himself up to the study of natural science, investigating chiefly the laws of sound. During the years 1802-12 he travelled and lectured with great success in Germany, Holland, Italy, Russia, and Denmark. Among his writings are treatises on acoustics and meteorites, of which he had a collection. See his life by Melde, 1866.

Chlaenaceae, small family of dicotyledonous trees or shrubs of no known use, native to Madagascar.

Chlaenius, genus of Carabidae, belongs to the Coleoptera. There are many species dwelling in Europe, Africa, Asia, and N. America; *C. sericeus* and *C. tomentosus*, 2 medium-sized purple or greeny-bronze beetles, are found in the U.S.A.



CHLAMYDOSAURUS KINGI: FRILLED LIZARD

Chlamydosaurus Kingi, or Frilled Lizard of Australia, represents a genus of the family Agamidae. It is noted for the

expanse of skin, in the shape of 2 large disks, which forms an ample frill to the sides of the neck and throat, and can be unfolded when the lizard is angry and folded again at will. In length it is about 3 ft. and when running it presents a curious spectacle, for it accomplishes the feat with its fore limbs in the air. The creature is allied to the iguana and in habit is arboreal. The general colour is yellowish-brown variegated with black.

Chlamyphorus, or Pichiela, edentate quadruped of the armadillo family, or Dasypodidae. The species, of which only two are in existence, are small animals covered over with 4-sided, horny plates which are thin in the front and strong in the hinder region. The external ears are very small, and the small eyes are buried in long silky hair; under the bony plates and over the whole body the straw-coloured hair also prevails. The limbs are short and there are 5 digits on the fore limbs. *C. truncatus*, a native of Mendoza, Argentina, is the more common species; it is about 5 in. in length, has strong burrowing habits, and is insectivorous in diet.

Chloasma, patchy deposit of yellowish-brown pigment in the skin. C. occurs notably in pregnancy and is also associated with ovarian dysfunction. The cause is obscure but is probably endocrine in origin.

Chlodowech, or Chlodwig, see CLOVIS.

Chlopicki (pron. *Chlopitski*), Gregorz Jozef (1772-1854), Polish general and patriot. He took part in the first Polish insurrection, then served under Napoleon in the Grande Armée. After the taking of Paris in 1814 he led back to Poland the remnant of the Polish troops and was made general of div. by the Emperor Alexander. After the second Polish insurrection (1830) C. became, though most unwillingly, dictator. He soon resigned in order to re-enter the army and fight as a simple soldier.

Chlora, see BLACKSTONIA.

Chloral (trichloroacetaldehyde, CCl_3CHO), formed by the action of chlorine on anhydrous alcohol. It is an oily, colourless liquid with a penetrating odour. Combined with water it forms C. hydrate (q.v.), while with alkalis it forms chloroform and a formate. It was discovered in 1831 by Liebig. It is used as a drug to produce sleep, when from 15 to 30 grains are sufficient. It is also used to alleviate pain, and to check excitement and convulsions, etc. Since it tends to reduce the heart's action and lower the temp. of the body its use is dangerous. See also HYPNOTICS.

Chloral Hydrate, commonly but erroneously called chloral, is chloral combined with water, and is a white crystalline substance with a pungent smell and a bitter taste. C. H. treated with caustic potash gives pure chloroform. It has anaesthetic properties, and is a drug. See also HYPNOTICS.

Chloramphenicol, see ANTIBIOTICS.

Chloranthaceae, family of tropical or subtropical dicotyledonous plants, consists of herbs, shrubs, and trees having an

aromatic fragrant odour. The hermaphrodite or unisexual flowers are small, sometimes with a sepaloïd perianth, 1 to 3 united stamens, an inferior ovary consisting of a single carpel, and a few seeds with oily endosperm and no perisperm. Chief genus is *Chloranthus*.

Chlorargyrite, see CERARGYRITE.

Chlorate, see CHLORIC ACID.

Cholesterol, alcohol occurring as a constituent of bile, gall-stones, egg-yolk, nervous tissues, and blood. It is a white crystalline substance, soapy to the touch, insoluble in water, but soluble in hot alcohol or chloroform. It is said to neutralise snake-poison.

Chloric Acid (HClO_3) is obtained by decomposing barium chlorate with its exact equivalent of dilute sulphuric acid. It is a clear, unstable liquid, and the strongest acid contains 60 per cent of water. It has powerful oxidising properties, and if wood or paper be dropped in it the oxidation is so rapid that they will char, and even take fire. It is a monobasic acid, and forms stable salts called *chlorates*. The most important of these is *potassium chlorate* (KClO_3). The chlorates are usually formed indirectly by passing chlorine into a hot solution of the hydroxide of the metal, and then crystallising out the chlorate. Chlorides are formed at the same time, but they are much more soluble and remain in solution. Potassium chlorate is manu. by the electrolysis of a hot concentrated solution of potassium chloride. Since chlorates contain a large amount of oxygen, they are used as oxidising agents, potassium chlorate being used in the manu. of matches, and in pyrotechny, especially where coloured effects are required; it is also used in tabloid form for the alleviation and cure of sore throat. Sodium chlorate is a very efficient and widely used weed killer.

Chloride, Ethyl, see ETHYL CHLORIDE.

Chloride of Lime, see BLEACHING and BLEACHING POWDER.

Chlorimetry, term applied to the estimation of the proportion of available chlorine in bleaching powder (q.v.). It varies from 20 to 43 per cent. The process is one of volumetric analysis. It is usual to make a definite solution of arsenious acid or some other substance which can be oxidised. The solution of bleaching powder is then carefully run into a measured quantity of the arsenious acid, and by the aid of an external indicator—a paper moistened with potassium iodide and starch—sufficient is added until oxidation is quite complete. The quantities of both liquids being known, the available chlorine can easily be found by calculation from the equation: $\text{H}_3\text{AsO}_3 + \text{CaOCl}_2 = \text{H}_3\text{AsO}_4 + \text{CaCl}_2$. Another method is to add an excess of potassium iodide to the solution of bleaching powder, acidified with acetic acid, and then titrate the liberated iodine with standard sodium thiosulphate solution.

Chlorine (symbol Cl; atomic weight 35.5; atomic number 17) was discovered by Scheele in 1774. He called it *dephlogisticated muriatic acid*, and regarded it

as a compound. In 1810 Davy proved it to be an element, and gave it its present name, because of its greenish-yellow colour. It does not occur free in nature, but it is very common in combination with metals, the commonest chloride being sodium chloride (common salt). As such it occurs in all natural waters; in beds as rock salt, in animal secretions, and in plants. In combination with hydrogen, as hydrochloric acid, it is found in volcanic gases and in the gastric juice. C. can be obtained in various ways: (1) by heating gently manganese dioxide and hydrochloric acid, water, manganese chloride, and C. being formed; (2) by heating manganese dioxide with a mixture of the substances from which hydrochloric acid is made, e.g. common salt and sulphuric acid. This results in the formation of sodium bisulphate, manganese sulphate, water, and C. A comparison of these two methods shows that whereas the second process results in the obtaining of all the C. from the common salt, the first process leaves half of it in the form of manganous chloride; (3) many highly oxidized compounds, together with hydrochloric acid, give us C., and among these substances may be named potassium dichromate and potassium chlorate.

Manufacturing processes: (1) *Weldon's process* is really a process by which the manganous chloride mentioned above can be turned again into manganese dioxide, and re-used to act upon further supplies of hydrochloric acid, giving further quantities of C. (2) *Deacon's process* depends upon catalysis (q.v.); air, or oxygen and hydrochloric acid, are passed over pumice impregnated with cuprous chloride (a salt of copper), which has been heated to a dull-red heat. Then water is formed and C. evolved. But Weldon's process is now obsolete, and Deacon's is rarely used. Most of the C. now manu. is obtained by the electrolysis of a solution of common salt.

Properties. It is a greenish-yellow gas, which has a suffocating smell. If inhaled in the pure state it would cause death. It acts very rapidly on the mucous membranes even when largely diluted in the air. Very dilute in the air, however, it imparts a pleasant odour to a room. It is two and a half times as heavy as air, but when heated its density is considerably less than it should be. So while at lower temps. its molecular formula is Cl_2 , i.e. has 2 atoms in the molecule, at higher temps. it must dissociate into single atoms. It is fairly soluble in water, although it may be collected over warm water, or over brine. It has such powerful chemical affinities that it will enter into combination with a large number of elements at the ordinary temp.: in many cases so violent is the combination that the other body takes fire, e.g. phosphorus, arsenic, antimony. It is remarkable to notice that if the C. be dry it will not unite with these substances. It has a strong affinity for hydrogen. If the two gases be mixed and heated, or even exposed to sunlight, they will unite with an explosion to form hydrochloric acid gas. C.

possesses strong bleaching powers by virtue of this great affinity for hydrogen, for it will unite with the hydrogen in water, displacing the oxygen, and this nascent oxygen acts on the natural colouring matter, bleaching it. It is this bleaching power which makes it valuable commercially, and for this purpose it is combined with moist slaked lime to form bleaching powder (q.v.). C. gas can be liquefied by lowering its temp. to $-34^{\circ}\text{C}.$, when it has a golden colour. At -104° it freezes into a yellow crystalline mass. As a liquid it is packed in lead-lined iron bottles and exported to be used in the extraction of gold by the *chlorination process*. Liquid C. enters into combination with the gold in the ore and forms a soluble chloride which can be separated from the insoluble residues. Then by suitable means the gold can be obtained. C. is one of the *halogen* group of elements, which are fluorine, C., bromine, and iodine, all of which possess similar properties. See BROMINE; FLUORINE; HYDROCHLORIC ACID; IODINE.

Chlorine in Warfare. The introduction of chlorine as a weapon in modern warfare dates from 22 April 1915, when the Germans discharged it from cylinders opposite a sector held by the French, while another attack was made on the Canadian front on 24 April. The gas was a complete surprise to the unprotected troops, and it removed all resistance on the front affected to a considerable depth. Crude respirators were soon supplied to the troops, and later much improved upon. The first gas attack by the British was made at Loos on 25 Sept. 1915, using cylinders of chlorine. It is noteworthy that conditions of wind were more frequently favourable to the Allies than to the Germans. The gas shell was eventually substituted for the cloud method, and found to possess many advantages. It is relatively independent of wind, and enables many more toxic substances to be used. Chlorine, phosgene, chloropicrin, and others were classed as asphyxiating gases, and produced their effect by causing lesions and congestion in the pulmonary system while death frequently resulted from suffocation. Chlorine was not used in the Second World War.

Chlorite, mineral of a green colour composed of silicate of alumina, iron, magnesia, and a certain amount of water. It is soft, and when crystallised in small green hexagonal crystals is scaly in texture. It forms the prin. part of C. schist in the region of the metamorphic rocks, and is also an alteration product of hornblende and other minerals in many crystalline rocks. There are many varieties; orthochlorites, which are crystalline, and leptochlorites, which are not.

Chlorite Schist, variety of schist composed of chloritic material such as clinochlore, together with quartz, mica, talc, feldspar, and other minerals.

Chlorite Marl, name given to what is really glauconite marl. It is a chalky marl of a white or yellow colour and situated at the base of the chalk. The name 'chloritic' was given owing to the

presence of grains of glauconite scattered through it, which was wrongly supposed to be chlorite. It also contains phosphatic nodules. The C. M., together with the chalk marl, the grey chalk, and the white chalk which overlies it form the div. called the Lower Chalk of the Upper Cretaceous Period. The prin. fossils are varieties of *Ammonites* or *Schloenbachia*.

Chloroannose ($\text{C}_7\text{H}_7\text{ClO}_6$), compound produced by the action of chlorine upon oil of cinnamon. When pure it exists as brilliant crystals, which are colourless. It volatilises by heat without change.

Chlorocyanic Acid, or **Cyanuric Chloride** $((\text{CN})_2\text{Cl}_2)$, is obtained when anhydrous hydrocyanic acid and chlorine are together exposed to the action of sunlight. It is crystalline, forming needles, and has a disagreeable smell. Heated with water it is decomposed, and gives cyanuric and hydrochloric acids.

Chlorodyne, popular patent medicine, first compounded by Dr Collis Browne. Owing to its dangerous nature and variability of composition, the latter was fixed by the Brit. pharmacopoeia of 1885 as chloroform, morphine, prussic acid, ether, and, in addition, peppermint and a syrup. It is useful for diarrhoea and coughs, but must be used carefully.

Chloroform, or **Trichloromethane** (CHCl_3), volatile liquid widely used as an anaesthetic. It has a pleasant odour, boils at $61^{\circ}\text{C}.$, has a melting point of $-63^{\circ}\text{C}.$, and a sp. gr. of 1.5 at 15° . It is not inflammable at ordinary temps., but burns with a green-edged flame when heated. It is formed when methane, methyl chloride, or methylene dichloride is treated with chlorine in sunlight, but is commonly prepared by distilling alcohol or acetone with bleaching powder, or by warming chloral or chloral hydrate with a solution of sodium hydroxide. C. quickly decomposes in air, especially in the presence of sunlight, carbonyl chloride and hydrochloric acid being produced. As carbonyl chloride is a dangerous impurity when the C. is used for anaesthetic purposes, it is customary to keep the liquid in the dark, and the addition of a small percentage of alcohol serves to effect the decomposition of any carbonyl chloride which may be formed. A good test of the purity of C. is provided by the addition of silver nitrate when no precipitate should form; it also should not darken when agitated with strong sulphuric acid. C. was introduced as an anaesthetic by Sir James Simpson in 1847, and it quickly superseded ether for long operations. It has about three times the potency of ether. It is administered by means of a loose-fitting mask which allows mixture of air, and the strength of the vapour is gradually increased. The effect of the inhalation is to produce first a state of disordered consciousness, which leads to complete unconsciousness. The reflexes persist for some time, and there are energetic movements of the muscles. In the next stage the muscles relax, and many of the reflexes disappear, though the vital centres in the medulla are still sensitive, and the heart muscle is active;

this is the stage suitable for surgical operation. Later, the vital centres in the medulla may become paralysed, in which case respiration stops and life is endangered. C. under skilled management is a safe anaesthetic, but owing to the ease with which an overdose may be given, and the risk of delayed C. poisoning causing fatty degeneration of the liver, heart, and kidneys, it is seldom used now except in emergency. C. is also administered internally as a stimulant, anodyne, and as an antidote to strychnine poisoning. Externally, it is used to dilate the superficial blood-vessels, and as a local anaesthetic in cases of toothache. See also ANAESTHESIA.

Chloro-nitrous Gas, or Nitrosyl Chloride (NOCl), orange-coloured gas obtained by the direct union of chlorine and nitric oxide. It is easily liquefied at about 5° C. and atmospheric pressure, and is readily decomposed in the presence of water and hydroxides of sodium, potassium, or ammonium.

Chloropal, massive mineral resembling opal. It is green in colour, and consists of a hydrous silicate of iron.

Chlorophyll, green colouring matter of plants, in which it is accompanied by 2 other substances, carotin ($C_{40}H_{56}$) and xanthophyll ($C_{40}H_{56}O_2$). C. is not a single compound, but, as was shown by Willstätter, a mixture of the bluish-green chlorophyll-a with about one-third of its weight of the yellowish-green chlorophyll-b.

Chlorophyll-a has the formula $C_{55}H_{72}ON_4Mg$ ($COOCH_3$) ($COOC_{10}H_{19}$), and chlorophyll-b a similar constitution except that it contains 1 atom of oxygen more and 2 atoms of hydrogen less. C. is insoluble in water, but dissolves in alcohol, benzene, and chloroform, and when extracted by the aid of one of these solvents, appears as a green amorphous mass. It is dichromatic, that is to say, when a thin layer is viewed by transmitted light, it appears green; but when the layer is of considerable thickness, it is dark red in colour. This is explained by the fact that whereas both red and green rays are transmitted, the green rays predominate in a thin layer, but are absorbed with greater facility than the red if the layer be thick. The development of C. in plants appears to depend on certain conditions of temp. and light, for if parts of a plant are hidden from sunlight, they quickly become blanched. The function of C. is to aid in the nourishment of the plant by absorbing carbon dioxide from the atmosphere and producing carbohydrates. The nature of the process (photosynthesis) is obscure, but sunlight is an important factor, and the C. cells appear to possess the power of absorbing radiant energy from the sun's rays, by means of which the necessary chemical changes are brought about. Viewed microscopically, the C. of plants is seen to consist of granules or corpuscles called chloroplasts, which are embedded in the protoplasmic substance of certain cells. The chloroplasts of the algae frequently exhibit a complicated appearance; in *Spirogyra*, for instance, they are spiral

in shape. It is associated with other pigments in the plant economy, and the changing colours of spring and autumn are probably due to changes in the relative amounts of C. and other pigments (anthocyanins, and also the xanthophyll constituent of the C. itself). The existence of C. is sometimes taken as the distinguishing characteristic of the plant as compared with the animal, but some plants seem to build up their tissues without the aid of C., and some animals, such as certain infusoria, hydra, etc., possess C., but this is due to symbiotic algae. Molluscs and crustacea frequently exhibit C. as the result of absorption from food.

Chlorophyllite, mineral consisting of quartz, chlorite, and muscovite, occurring in scales or laminae. It is a variety of the larger group of the phyllites, minerals intermediate in character between the clay-slates and the mica-schists.

Chlorovaleric Acid, chlorine substitution product of valeric acid. When the anhydrous valeric acid is mixed with red phosphorus and dry chlorine passed into the mixture in the presence of sunlight, an atom of chlorine is substituted for an atom of hydrogen.

Chlumec (Ger. Chlumetz), Czechoslovak tn in the region of Hradec Králové (q.v.), on the Cidlina. Pop. 4100.

Chlumetz, see CHLUMEC.

Chmielnicki, see KHEMEL'NYTSKY.

Che-Bo, tn of Tong-king, Indo-China, situated on the Song Bo (Black R.) at the point where the riv. bends N. before it enters the Song Koi (Red R.). It is an important trading centre, and gold is worked in the neighbourhood.

Cho Oyu, Himalayan mt in E. Nepal, 20 m. to the W. of Everest; height 26,750 ft. It is the world's seventh highest mt. It was first reconnoitred in November 1951 by W. H. Murray and T. D. Bourdillon, who discovered the best route on its NW. face. This route was twice attempted; once, unsuccessfully, in 1952 by a large Brit. expedition led by E. Shipton; again in 1954 by a party of 3 Austrians and 5 Sherpas led by Dr Herbert Tichy, who wished to demonstrate that a very big mt could be climbed by a very small party. On 19 Oct. he, S. Jochler, and Pasang Dawa Lama reached the summit. They carried no oxygen.

Chobe, or Linyanti, River, trib. of the R. Zambezi, N. Rhodesia, discovered by David Livingstone, 1851.

Chocolate, see COCOA and CHOCOLATE.

Choctaws, tribe of N. Amer. Indians of the Muskogean family, now largely intermarried with white and Negro stock. They are now citizens of the U.S.A., numbering about 18,000, mostly in Oklahoma. They sided with the Confederates in the Civil war, and suffered the loss of all their rights. They were one of the Five Civilized Tribes. They practised head deformation of infants, and are often thereby known as 'flatheads.'

Chodkiewicz, Jan Karol (1560-1631), Polish soldier, most famous member of a famous family. He served under Alva

in the Low Countries and, later, under Zamoycki in the Turco-Moldavian campaign, where he obtained high command. Played a prominent part in resisting repeated Swedish invasions of the Baltic provs. He was made a hetman of Lithuania in 1605 and won a remarkable victory with 4000 men against a Swedish army of nearly 20,000. In 1619, however, he was forced to sue for peace, his position having been undermined by revolts. Subsequently, when the Turks and Moldavians attacked Poland and defeated Zolkiewski, C. counter-attacked and completely defeated the invaders, but d. soon afterwards.

Chodowiecki, Daniel Nicolas (1726-1801), Polish painter and engraver, b. Danzig. He produced the famous set of miniatures, 'The History of the Life of Christ,' but his large output is on the whole somewhat trivial in nature, though he was a capable portrait painter and book illustrator. He has occasionally been known as the Ger. Hogarth, possibly because of his truthful representation of middle-class life. He became the director of the Berlin Academy in 1797.

Chodzko, Alexander (1804-61), Polish poet and oriental and Slavic scholar. He was appointed Russian consul to Persia, 1829, and made a special study of the language and literature of that country and also of other oriental languages. In 1842 he went to Persia, and in 1858 succeeded Mickiewicz as prof. of Slavonic literature at the Collège de France. He was the translator of many Persian poems, among others 52 lamentations or miracle-plays concerned with the deaths of Hassan and Husein. He pub. *Popular Poetry of Persia*, 1842, and *Fairy Tales of the Slav Peasants and Herdsmen*, trans. into English, 1895, a Persian grammar, and many other works.

Choerilus: 1. Athenian tragic poet, competed with Aeschylus, 499 BC. Said by Suidas to have written 150 plays, but none is extant.

2. (5th cent. BC), Gk epic poet, b. Samos. Fragments of his *Perseis*, written at the court of Archelaus of Macedonia, have been preserved. See G. Kinkel, *Epicorum Graecorum Fragmenta*, I, 1877.

Choeropus Castanotis, pig-footed bandicoot, an Australian marsupial of the family Peramelidae. It is an omnivorous, burrowing animal with long ears and tail, and the two well-developed digits on its fore limbs give them a pig-like appearance. It lives on grassy plains.

Choir, formerly spelt *quire*, as it is pronounced (from O.F. *cuer*, modern *choeur*; Lat. *chorus*), the name of the trained or organised body of singers who take part and lead in the musical portions of a church service, or perform portions of the service alone, where the congregation do not join, as in the singing of anthems. The term is also applied to a body of male and female singers who perform the choral portions of a musical composition; and to the part of the church used by them. In the Anglican Church, the C. usually consists of male voices only, boys taking the treble or soprano

parts, and boys or one or two rare male voices the alto or contralto parts, and men the tenor and bass. They usually are surpliced. In cathedrals they are divided into 2 portions, *cantoris*, i.e. on the precentor's or N. side of the chancel, and *decani*, on the dean's or S. side. The men form a special body attached to the cathedral and are termed vicars-choral or lay clerks.

Choir, in architecture, that portion of a church which is specially reserved and furnished for choristers. This is usually, but not invariably, in the E. part of the church, occupying the W. half of the chancel (q.v.) or sanctuary. Hence the terms 'chancel' and 'choir' have come to be almost synonymous; but this usage may be incorrect, e.g. at Westminster Abbey, where the C. is in the nave.

Choiseul, César, Duc de, Sieur du Plessis-Praslin (1598-1675), Fr. general who distinguished himself at the siege of La Rochelle, 1628, and in Piedmont, 1636-1643; at the end of which campaign he was made a marshal. Gained a decisive victory over the Spaniards at Trancheron in 1648, and, soon afterwards, having been given the command of the royal forces in the war of the Fronde, he defeated Turenne at Rethel, 1650. Created duke in 1665, also known as the Marshal du Plessis.

Choiseul-Amblose, Étienne François, Duc de (1719-85), Fr. statesman, eldest son of François Joseph de C., Marquis de Stainville (1700-70), b. Lorraine. He entered the army and fought in the war of the Austrian Succession. He became lieutenant-general after seeing service in Italy and Bohemia. He gained the favour of Mme de Pompadour, and after various diplomatic missions became minister for foreign affairs in 1758, and he controlled the Fr. foreign policy through the Seven Years War. He became minister of war and marine, and again minister of foreign affairs in 1766. Having failed in his Austrian policy he strove to retrieve the situation by an alliance with Spain, known as the Family Compact (1761), but it was too late to save Canada or the Fr. possessions in India from Great Britain, and he turned his energies to fresh colonies in the Antilles and San Domingo. In 1768 he annexed Corsica with the hope of its future use in the colonisation of Africa. After Mme de Pompadour's death, however, Mme du Barry soon persuaded Louis XV to dismiss him, and he then retired to Chanteloup. In 1774 Louis XVI recalled him, but did not restore him to favour. See F. Cailmettes (ed.), *Mémoires du duc de Choiseul*, 1904.

Choisy-le-Roi, Fr. tn in the dept of Seine, on the Seine, 7 m. S. of Paris. It has the remains of a royal château, and there is a parachute training centre. Rouget-de-Lisle (q.v.). d. here. Its manufs. include chemicals, glass, and pottery. Pop. 27,200.

Choke-cherry, name given to *Prunus virginiana*, a N. Amer. shrub, yielding small dark red fruits of harsh taste.

Choke Damp, miners' term for carbon

dioxide. Under ordinary circumstances it may be found in recesses or badly ventilated places in the mine, but is formed in huge quantities when an explosion of coal-gas mixed with air occurs, owing to the combination of the carbon of the gas and the oxygen of the air. When formed in this way it is known as *after-damp*. When the atmosphere is charged with a large amount of carbon dioxide, symptoms of suffocation occur through deficient oxidation of the blood.

Choking, suffocation by obstruction or compression of the windpipe. Any object indrawn into the windpipe when swallowing food is usually the cause of C.; such objects, fishbone, piece of bread, etc., become impacted in the glottis, at the top of the windpipe, blocking the passage. Children, also, often get buttons, small coins, etc., lodged in the same place. The natural response of nature is to cause a fit of violent coughing which removes the obstruction. Failing this, where cases threaten to prove fatal by asphyxiation, tracheotomy must be performed, i.e. an incision is made into the trachea from the front of the neck, so that a tube can be inserted; the operation was formerly often necessary in the treatment of diphtheria. In cases of external compression of the windpipe, such as in strangling, hanging, or garrotting, the heart and lungs are paralysed, breathing ceases, and death occurs in a few seconds. It should be noticed that in execution by hanging, C. does not occur, death being produced by dislocation of the neck vertebrae.

Choking-coil, inductance coil used on A.C. circuits for reducing the current without appreciable loss of power, the resistance being small. The effect can be made variable by providing the coil with a core consisting of a bundle of iron wires, which can be pulled out or pushed in, thus decreasing or increasing the inductance. A core increases the power loss by iron losses (q.v.).

Chola, name of an anc. div. and dynasty of the Tamil country, India, between the Cauvery R. and the S. Penner, Madras. The whole S. peninsula of India was once ruled by the C. dynasty. Its hist. began in AD 860 but it gradually declined, and was extinguished in the 11th cent.

Cholecystitis, see GALL BLADDER.

Cholelithiasis, see GALL-STONES.

Cholera (Gk *kholera*) synonymous with Asiatic cholera, acute infectious disease caused by the *Vibrio cholerae*. Asiatic C. has its home in India, particularly in the lowlands of Bengal, and was confined to E. countries until the 19th cent. In 1817 an epidemic of C. spread from India to Japan in one direction and in the other reached Astrakhan in 1823. Another epidemic started in India in 1826, reached Astrakhan in 1830, Moscow and Berlin in 1831, Paris and the Brit. Isles in 1832; it was carried by emigrants to Canada in the same year, and raged with varying virulence until 1838. The next great epidemic reached Europe in 1847 and lasted until 1855. In 1865 the disease again appeared in Europe, travelling

from India to Mecca, whence it was disseminated by pilgrims to Egypt and other parts. In 1884 it reached Europe again by the same pilgrim route and was carried to S. America by an It. ship. In 1892 a severe epidemic appeared in Paris and subsequently in Germany and Russia. In Hamburg there were 16,956 cases and 8605 deaths. By 1895 the disease had exhausted its energies in Europe, though it still prevailed in Arabia, Persia, China, and Japan as well as in India. The specific cause of Asiatic C. is a micro-organism which invades the intestines and develops there. R. Koch, in 1883, found in the stools of C. patients in Egypt a microbe of the genus *Spirillum*, which he called the 'comma' bacillus (actually bacterial vibrios) from its shape, and asserted it was the cause of the disease. It is a very motile organism, possessing a single long flagellum, and appears only in the intestinal tract. Cultures of this microbe show it to be a somewhat weakly organism, unable to live at a temp. above 60° C. or in the presence of any acid, being at once killed by drying, and readily overgrown by other bacteria. When these facts were estab., scientists found it difficult to believe that the comma bacillus could be responsible for such widespread and obstinate outbreaks of disease, and many attempts were made to account for its virulent nature under certain conditions. The outcome of the investigations seems to credit the microbe with two or more stages of development. Like many other parasites, when it emerges from the human body, it has to develop under certain other conditions of temp., moisture, and food, before it regains its virulence. The reservoir, or source, of infection is usually symptomless carriers of the infection who are either convalescent from an attack of the disease or are suffering from it in a mild form. The disease may be both air- and water-borne. In Hamburg the drinking of unfiltered riv. water was undoubtedly the cause of the outbreak of 1892, as in Altona, where the water was filtered, the pop. escaped except for cases imported from Hamburg. Modern methods of sanitation and, in particular, the chlorination of water supplies have greatly limited the incidence of C. The symptoms are usually classified in three stages. There is first of all a preliminary diarrhoea which may not occasion alarm; the characteristic C. attack follows, including vomiting and profuse liquid evacuations. These are very frequent, and soon become of the colour and consistency of rice-water or thin gruel. Owing to the great loss of water, other secretions are lessened, the urine becomes totally suppressed, the skin shrinks and assumes a grey tinge, the calves and other muscles are cramped, and the patient suffers from an unquenchable thirst. The third stage may be asphyxia or recovery. In the asphyxial stage the skin becomes dark grey and the circulation of the blood becomes more and more sluggish, until the cutting of a vein fails to produce any outflow of blood. If the patient survives he proceeds to the

stage of recovery, when cyanosis vanishes, the evacuations resume their yellow colour, the urinary secretion returns, and the circulation improves. There is always danger of a relapse, and the occurrence, the so-called *C. typhoid*, may lead to death. The average rate of mortality in an epidemic is about 50 per cent. Curative treatment should commence with the preliminary diarrhoea. When *C.* is threatened, all cases of diarrhoea should be suspected. The patient should take to bed and endeavour to produce a mild perspiration. Transfusions of hypertonic alkaline saline should be given; a suitable solution is 180 grains of sodium bicarbonate and 90 grains of sodium chloride in 1 pint of sterile water. No specific chemotherapeutic agent has been discovered. Opium, morphia, and alcohol are to be avoided. Potassium permanganate should be administered *per anum* in all cases of *C.*, to oxidise and so destroy the toxins produced by the germ in the intestine; Kaolin is also useful for the same purpose. Barley water can be given to combat the dehydration, even if vomiting occurs. Preventive measures are of the utmost importance when *C.* is threatened. An effective *C.* prophylactic vaccine is available, and persons proceeding to *C.* districts should be inoculated beforehand. There should be the utmost cleanliness in everything concerning the water supply and the disposal of sewage. Travellers should be kept under inspection, and public authorities should thoroughly disinfect all dustbins, water-closets, etc., whether owned privately or not. The individual should practise personal cleanliness, boil all water and milk before drinking, avoid uncooked fruit, and excess in alcoholic liquors.

Cholera nostras, gastro-enteritis resembling true Asiatic *C.* but usually caused by bacilli of the paratyphoid or coli group. *Cholera infantum*, term used to describe the more severe forms of summer diarrhoea in infants. See J. S. Chambers, *Conquest of Cholera*, 1938, and Manson's *Tropical Diseases* (14th ed.), 1954.

Cholet, tn in the dept of Maine-et-Loire, France, situated on the r. b. of the Maine, 30 m. SW. of Angers. There are large cattle markets, and textiles, footwear and preserves are manuf. There are also bleaching and dye-works. Pop. 23,200.

Chollambus (Gk *chólos*, lame), iambic line with a spondee or trochee instead of an iambus in the last foot. Termed the limping iambus, it was used by Gk and Lat. poets to give a ludicrous or satirical effect.

Cholmondeley, Mary (1859-1925), novelist, granddaughter of Mary Heber, sister of Bishop Heber (q.v.). Her *Red Potage*, 1899, won considerable success. She had previously written 3 other novels, *The Danvers Jewels*, 1887, *Sir Charles Danvers*, 1889, and *Diana Tempest*, 1893. Her later novels included *Moth and Rust*, 1902, and *The Lowest Rung*, 1908. *Under One Roof*, 1918, is a book of reminiscences.

Cholon, Chinese city adjoining Saigon in Cochín-China. It was founded by Chinese merchants in about 1778 and has

remained almost exclusively Chinese. *C.* is the centre of Cochín-China's network of canals and rivs. and the H.Q. of its rice trade. Most of Viet Nam's rice-mills are situated in *C.*, which also manufs. cigarettes, glass, textiles, sugar, and alcohol. Estimates of pop. vary widely, but it is probable that more than half a million Chinese people live in *C.*

Cholula, city, Puebla state, Mexico, a railway junction and agric. processing centre, 6 m. from Puebla, with an ancient Indian pyramid or teocalli crowned by a Sp. church. Here the Mexican god Quetzalcoatl passed 20 years in teaching the Toltecs the arts of civilisation. The pyramid was erected in his honour, and crowned with his temple and image. Six thousand human victims are said to have been sacrificed annually at this and the other sanguinary shrines in *C.* It was claimed by Cortés the Conqueror that the sacred city contained 40,000 houses. In 1519 he destroyed the city. Pop. 8400.

Choluteca: 1. Dept of S. Honduras on the Gulf of Fonseca, part of the coastal plain providing transcontinental communication. Agriculture, livestock raising, and dairying are the prin. occupations. Area 1966 sq. m.; pop. 118,000.

2. Cap. of above dept, one of the oldest cities in the country, 55 m. S. of Tegucigalpa. Products include coffee and cattle; there are light industries. Pop. 5300.

Chomolhari, or Chomo-lha-ri, peak of the Himalaya Mts. over 23,930 ft high, between Tibet and Bhutan, E. of Sikkim, 140 m. from Mt Everest, rising above the main route from India to Gyantse. First ascent by F. S. Chapman and Pasang Dawa, 1937.

Chomolungmar, see EVEREST, MOUNT. **Chomutov** (Ger. Komotau), Czechoslovak tn in the region of Ústí and Labem (q.v.), at the foot of the Erzgebirge (q.v.). It is in a coal-mining dist., and has an important engineering industry. Pop. 26,700.

Chondracanthus, curious genus of parasitic copepod crustacean in which the large females attach themselves to the gills of living fish, and the small males attach themselves to their feminine counterparts.

Chonos Archipelago, group of over a thousand rocks, is., and reefs off the W. coast of Chile in the provs. of Chiloé and Aysén between lat. 44° and 46° S. They are inhabited only by a few nomadic Indians, and are separated from the mainland by the Moraleda Channel.

Chopi, Bantu tribe of Mozambique, who provide much labour for the Rand gold-mines. They are famous as musicians, with large orchestras of Marimbas. There is also an unrelated tribe of the same name in central Uganda. See H. Tracey, *Chopi Musicians*, 1948.

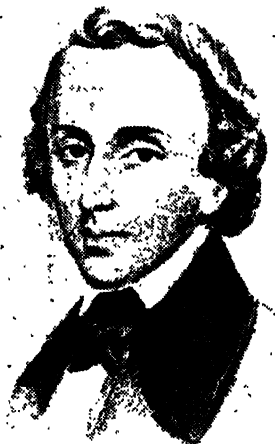
Chopin, Fryderyk Franciszek (Frédéric François) (1810-49), Polish composer and pianist, b. Zelazowa Wola, a vil. 30 m. from Warsaw, of Polish-Fr. parentage. His father was an emigrant Fr. book-keeper and subsequently a teacher. Although he spent half his life in Paris,

C. became the greatest exponent of Polish nationality in music. He showed early genius in music and, at the age of six, began his musical training under Zywny, a Bohemian and teacher of piano. In 1823 he was sent to a Warsaw college, where his genius began to assert itself, and while there he received instruction in composition from Józef Elsner, a Silesian and director of the conservatory at Warsaw. Later he became a pupil at the Warsaw Conservatory. His fellow students there introduced him into the best circles of Polish society, and these early impressions of cultured life were of

had to be carried upstairs. After a visit to Scotland, where he stayed at Lord Torphichen's country seat, he went back hysterically to Paris, but only to die on 17 Oct. 1849; he was buried in Père Lachaise cemetery beside Bellini and Cherubini.

C.'s compositions embrace the imaginative melancholy of the Slavonic peasant as well as the grace and culture of the Polish aristocrat, and his character shines out through much of his work. His compositions stand alone owing to the peculiar nature of his genius; they are extremely individualist and of a pronounced style and full of poetic imagery. He employed dance forms and rhythms—particularly the mazurka—round which to weave many of his melodies. He has been well described as the poet of the piano—a lyric poet for the most part, though sometimes a dramatic poet. The list of his compositions is so prolific in mazurkas, waltzes, polonaises, and other forms of national dance music that it is sometimes difficult to believe that they are so often the expression of a deeply melancholy nature—a seeming paradox, yet explained by the type of C.'s nationality, a nationality which has been justly described as sadness personified. What music C. composed for other media than the piano is negligible, for even when he associated other instruments with the piano they were obviously subordinated to it. Among his compositions are 27 études, 24 preludes, 20 nocturnes—the style and name of the pianoforte nocturne he owed to the Irish composer, John Field (1782–1837)—59 mazurkas, 16 polonaises, 14 waltzes, 4 ballades, 4 scherzos, 3 impromptus, 3 sonatas, and 2 concertos. Some of these are still the most popular of all recital items. Excepting a collection of Polish songs, the 2 concertos above mentioned, and a few concerted pieces of chamber music, almost all the works of C. are written for pianoforte solo; the symphony, the oratorio, and the opera he never attempted. He was among the finest executants as a pianist, and in this art Liszt alone approached him. He was among the first to use the thumb freely on black keys. Many of his pieces, with eerie effects or echo effects or fairy-like accompaniments, depend for their adequate rendering on the use of a particularly subtle kind of finger technique and pedalling, and are indeed a good test of the varied resources of the skilled pianist.

The house in which C. was born was taken over by the Polish nation in 1934 and extensive gardens were laid out. In the Second World War the Germans stripped it of all its furniture and things of value; but after the war the Poles gradually collected various pieces of furniture, pictures, etc., which had been saved by the composer's admirers, with a view to furnishing the house at Żelazowa Wola as a worthy place of pilgrimage. The Poles see C.'s music as the noblest expression of the romanticism in their soul; his whole life, his patriotism, his death, and his request that his heart be brought back to Poland all made the strongest appeal



CHOPIN

After a drawing by A. Duval.

enduring influence on C.'s development, both as a man and as an artist. His début as a pianist was in Vienna in 1829, and his first appearance in public was marked by considerable success. Two years later he proposed to visit London, but, on reaching Paris, settled there. Here too he soon became a favourite of society and was the friend of Berlioz, Bellini, and Liszt. Here began his friendship with Mme Dudevant, otherwise George Sand, who exercised an important influence on his life. When in 1838 his pulmonary trouble began he accompanied George Sand, with her children to Majorca; but though she nursed him with solicitude, he made no permanent recovery. The last 10 years of his life were a continual struggle with the disease to which he succumbed. The revolution of 1848 drove him out of Paris to Britain, where he was a centre of attraction in the chief cities, but eventually he became so weak that when he was to play at some great house he

to Poland's imagination. The return of C.'s heart to its former resting-place in the Church of the Holy Cross in Warsaw, from where it was removed and hidden from the Germans during the war, was the occasion of a great national demonstration in which the Polish president and the leading members of the regime took part. Efforts were made to have the remains brought back from France not later than 1919, in time for the centenary celebrations, to be marked also by the pub. of a revised ed. of his works, collected and ed. by Paderewski, and the holding of an international C. congress in Warsaw. Sev. years before the war the C. Institute arranged for Paderewski to edit the revised ed. and to add his own interpretations. Paderewski collected all the various eds., including 19 nocturnes, 14 waltzes, and 7 items which had first been pub. by the Oxford Univ. Press. He found that in the course of a cent. many errors called for correction, and he devoted the last years of his life to completing the task (1939). The new ed. was actually started in 1939 and all the proofs and annotations had to be hidden in a cellar in Warsaw. Because of a lack of printing facilities the proofs were, after the war, sent to America for pub. there in time for the centenary. See A. Hedley, *Chopin*, 1947; W. Murdoch, *Chopin: his Life*, 1938; G. Abraham, *Chopin's Musical Style*, 1939.

Chopine (Sp. *chapin*), very high clog or patten, sometimes half a yard high, of oriental origin, introduced into England from Venice in the reign of Elizabeth I.

Chopsticks, implements used by the Chinese and Japanese to pick up their food, the equivalent of the knife and fork. They are made of either ivory or wood, and held between the fingers and thumb of the right hand in much the same way as sugar-tongs.

Choragus, or **Choregus**, in anct Greece, the name given to the citizens who bore the expense of the chorus furnished by each tribe for public festivals, and also to the musician who directed the tribal chorus. The most successful C. in competitions was rewarded with an engraved tripod, which he consecrated and set upon a monument. The choragic monuments of Thrasylus and Lysicrates still exist at Athens.

Choral Service, services in the Eng. and Rom. churches where the psalms, responses, etc., are sung, not said.

Chorale (Ger. *Choral*), named applied to a particular form of musical composition for voices which was introduced by Luther into the services of the Ger. Reformed Church. The words were always in the vernacular and in the form of hymns. The music was not always original, being sometimes secular and sometimes adapted from hymn tunes of the Rom. Church. Luther and his friends, Walther and Senfl, pub. the first important set of chorales at Wittenberg in 1524.

Chorale Prelude (Ger. *Choralvorspiel*). The singing of the chorale (see above) in the Ger. Reformed Church being done by the congregation, accompanied by the

organ, the practice arose in the 18th cent. of playing an introduction, first of all simply to establish the key of the hymn for the singers and to remind them of the hymn tune that was already familiar to them. Organists skilled in improvisation then naturally yielded to the temptation of weaving these tunes into some kind of a free instrumental fantasy, and so organ pieces based on them became estab. and were often written down to be preserved for posterity. The great exponent of the organ chorale prelude is J. S. Bach, who developed it with the utmost skill and variety; but it was not his invention, for he had learnt to cultivate it from such predecessors of his as Böhm, Buxtehude, Pachelbel, and Reinken.

Chord: 1. Music, the simultaneous sounding of notes of different pitch. The common C. consists of a note with its major or minor third and fifth.

2. In geometry a C. is a straight line joining two points on the circumference or curve of a circle, ellipse, parabola, etc. In a circle the greatest C. is a diameter, and the length diminishes as it recedes from the centre. The perpendicular drawn from the centre bisects the C.

Chordata, term used in speaking of all animals which have at some period of their life the organ which functions as a supporting rod, the *notochord*. In some of the lowest members of the group this elastic rod is present only in the earliest stages of their life, while in the highest members it is eventually replaced in the adult by the spinal column. Other universal features are the presence of gill-slits and a central nervous system. Zoologists are by no means agreed upon the creatures which may be included in the C., and though the Amphioxus and all vertebrates have an assured position, opinions vary as to the claims of such lower forms as the Tunicata and Enteroptneusta.

Chorea, or **St Vitus's Dance**, disease of the nervous system related to, and perhaps a form of, rheumatic fever (q.v.). C. occurs most frequently in childhood, but is apt to recur under conditions of stress (such as pregnancy) in adult life. It is commoner in girls than boys—it is characterised by involuntary, jerky, purposeless movements and inco-ordinated voluntary movements. The contents of cups, glasses, etc., are spilt and feeding is sometimes difficult. The child becomes easily excited and depressed, and is generally emotionally unstable. Recovery is slow and some inco-ordination of movement may remain. As with rheumatic fever there is a tendency for the heart to be affected. C., at one time commonly seen, is now like rheumatic fever, a comparatively rare disease. There is no doubt whatever that improved standards of living is responsible for this. *Huntington's C.*, or *hereditary C.*, is a hereditary form of C. coming on gradually in the third or fourth decades. Apart from the typical inco-ordinated movements, which become increasingly more severe, there is degeneration of the cortical brain cells and mental deterioration.

Choreography, art of arranging the steps, movement, and pattern in the creation of a dance or a ballet. Originally the term denoted the art of recording dances by a system of symbols, but the term 'dance notation' is now applied to this. There have been many such systems invented, the most widely used at the present time being Labanotation.

Choriambus, in classical prosody, a foot consisting of 4 syllables, of which the first and last are long, the second and third short (— — —). It is so called because it consists of a trochee (choree) and an iambus.

Chorley, municipal bor. and tn of Lancs, England, situated on the R. Chor, 20 m. N.W. of Manchester. The manuf. of cotton yarn and goods is largely carried on, and there are calico printing, bleaching, heavy motor engineering works, and a Royal Ordnance factory. Coal, iron, lead, and slate are found in the neighbourhood. Pop. 33,000.

Chorlton-cum-Hardy, residential dist. of Manchester (q.v.).

Chorlu, or **Tchorlu**, tn and riv. in Turkey, 60 m. W. by N. of Istanbul. Scene of much sanguinary fighting between the Turks and Bulgarians in 1912.

Chorotegans, one of the larger tribes of Central America. Their land extended from Fonseca Bay to the E. side of Lake Nicaragua. At present they have nearly all become swallowed up in the Sp.-Amer. communities of Honduras and Nicaragua, where they form the main constituent element. They were for long under Aztec and Maya influence, but the early Sp. missionaries had their temples destroyed, their idols broken, and their graves despoiled. On the is. of Lake Nicaragua are some colossal basaltic monoliths which are supposed to be of Chorotegan origin. They are for the most part in the form of human figures, very rudely carved. The C. were notorious cannibals.

Chorus, word which originally in Greek meant a dance (*choros*) accompanied by singing, employed at festivals in honour of the gods, especially of Dionysus, and thus developed into the songs accompanied by rhythmic movement forming the lyric parts of the Gk tragic and older comic drama. It is thus applied to the body of singers in opera, oratorio, cantatas, etc., who sing the music written for large groups of voices in parts for each type of voice, soprano or treble, contralto or alto, tenor, and bass. A C. may be distinguished from a glee which is properly written for single voices to each part. Hence when a portion of a song is to be sung, not by a single singer but by a number of singers, it is styled a C. In the Elizabethan drama, the word is applied to a single character who spoke the epilogue and prologue.

Chorzów (Ger. *Königschütte*), tn of Poland, in Katowice prov., 4 m. N.W. of Katowice (q.v.). It was formed in 1934 by the fusion of the coms. of Królewska Huta (1934 pop. 81,000), Hajduki Nowe, and C. It is an important coal, iron, steel, chemicals (nitrates), and engineering centre. Pop. 142,000.

Chose in Action, in its general significance, means all rights over property which, in contradistinction to those which can be asserted by taking physical possession of the property, can only be enforced by action. It is, however, a term of many shades of meaning, all of which have been the subject of much legal controversy. In its other but related senses it may mean the property itself which is the subject of personal rights or the instrument which evidences those rights. In the sense of the property itself the term has been held to comprise, *inter alia*, shares and stock in companies, insurance policies, patents, debentures, tithes, negotiable instruments, debts of all kinds, annuities, trusts, legacies, reversionary interests, and advowsons. In contradistinction to choses in possession (a thing of which a person has physical possession), C.s in A. were not transferable at common law, but by the custom of merchants, the rules of equity and statute law, certain C.s in A. became assignable, and hence it was that prior to the Judicature Act, 1873, C.s in A. were commonly classified according to the mode of assigning them. C.s in A. not being assignable at common law, the result was that a person who purported to assign could not maintain an action in his own name against the debtor. But by the Judicature Act, 1873, all C.s in A. are made assignable by agreement in writing signed by the assignor, provided written notice is given to the debtor or trustee, and the assignment is absolute and not by way of charge. See L. A. Goodeve, *The Modern Law of Personal Property*.

Chosen, see KOREA.

Choshi, city of Chibaken, Japan, on the E. coast of Honshu, 72 m. from Tokyo. The chief industry is fishing, and fish oil is manufactured. Pop. 85,000.

Chos-Malal, former cap. of the Neuquén ter., Argentina, on the Neuquén R., 465 m. inland from Bahía Blanca. It is a mining centre. Pop. 1000.

Chosroes I, II, see KHUSRAW I, II.
Choszczno (Ger. *Arnswalde*), tn of Poland, in Szczecin prov., on a lake 44 m. SE. of Szczecin (q.v.). Until 1945 it was in Pomerania (q.v.). The tn was very severely damaged in the Second World War. There is a textile industry. Pop. 7000.

Chotusitz, see ČÁSLAV.

Chou Caraihe, see BRAZIL CABBAGE.

Chou En-lai (1898—), premier and foreign minister of the People's Rep. of China. A native of Hui-an, Kiangsu, his father was a gov. official. C. E. went to the Nankai High School, Tientsin, in 1913, and from there proceeded to Nankai Univ. After graduation in 1920 he studied in France, England, and Germany. In 1921 he took part in the meeting which formally estab. the Paris branch of the Chinese Communist party (hereafter abbreviated C.C.P.). Returning to China in 1924, he was appointed secretary of the Kwantung prov. branch of the C.C.P. in Canton. The Nationalists were then co-operating with the C.C.P. and C. E. was appointed the chairman of the political

dept of the Whampoa Military Academy, of which Chiang Kai-shek was principal. In 1926 C. E. was the political commissar of Chiang's First Army, which launched the N. expedition. C. E. soon left the army and went to Shanghai to organise the urb. workers for an uprising against the war lord regime. In April 1927, however, Chiang's Kwangsi army entered Shanghai and C. E. was taken prisoner. He escaped, and on 1 Aug. was one of the organisers in the Nanchang uprising of the Fourth Army which became the first Communist army in China. From 1929 to 1935 he was successively chairman of the Organisation Bureau, chief of the Military



CHOU EN-LAI

Bureau, and vice-chairman of the Military Commission of the C.C.P. After the successful long march of the Red Army from Kiangsi to Yenan in 1935 he was elected a member of the Politburo and a secretary of the Central Committee of the C.C.P. When Chiang Kai-shek, on 12 Dec. 1936, was held captive by his subordinates in Sian, it was C. E. who counselled moderation and rescued Chiang from being executed and thereby formed the united front between the C.C.P. and the Nationalist party to counter Jap. aggression in China; he became the representative of the C.C.P. in Chungking, and it was owing partly to his diplomatic skill that a precarious *entente* between the two rival parties was maintained throughout. He became premier and foreign minister of the Communist gov. after the overthrow of Chiang's regime in China. C. E. emerged as an important international figure in 1954 in the Geneva Conference at which the war in Indo-China was brought to an end. In the following

year in the Bandung Conference of Asian and African politicians he gained reputation by proposing direct negotiations with the U.S. Gov. on Far E. problems. As premier of the People's Gov. he has especially cultivated friendly relations between China and the 'new' Asian countries, including India, Pakistan, and Ceylon. (See CHINA, History.)

Chou Shu-jen, see LU HSÜN.

Chouans, Breton word, meaning 'screech-owls.' This name was given to a band of smugglers, who rebelled during the Fr. Revolution and joined the Royalists in La Vendée. They were led by Jean Cottureau (1767-94), a dealer in contraband salt, whose trade was ruined by the destruction of the inland customs. Under his leadership the C. carried on a guerrilla warfare against the Republicans; his company soon grew into an army which was known as *La Petite Vendée*. Cottureau was killed in an ambush, and his place was taken by Georges Cadoudal (1771-1804). The insurrection then spread through Brittany and the W. of France. The devotion of the Bretons and the energetic skill of Cadoudal made this revolt a menace to the rep. The little army had grown to 10,000 men, who regarded the revolt almost as a holy war; they were finally beaten by Lazare Hoche at Quiberon (20 July 1795). Cadoudal was imprisoned but escaped, and though open warfare was now impossible, he continued plotting; he was arrested and executed in Paris, June 1804, with sev. others, but the movement was not finally suppressed until 1815.

Choudard, Pierre Jean Baptiste, see DESFORGES.

Choughs (*Pyrrhonorax*), group of the crow family or Corvidae. It includes sev. species, of which the Cornish Chough (*Pyrrhonorax pyrrhonorax*) is an example. They are allied to the magpies and jays; the name is given to them in imitation of their cry. The species are usually black, with red feet, and a long, powerful yellow or red beak; the claws are long and hooked. In diet the C. are frugivorous and insectivorous. The Alpine C. (*P. graculus*) differ from the true C. in their shorter bill, and in having the cheeks bare, not feathered as in the genus *Graculus*. Only one species of this genus is known.

Chouquet, Adolphe Gustave (1819-1886), Fr. musical writer, b. Le Havre. In 1871 he became keeper of the collection of musical instruments at the Paris Conservatoire de Music, and he issued an illustrated catalogue of that collection in 1875. His chief work is *L'Histoire de la Musique dramatique en France*, 1873.

Chow-chow, or Chow, Chinese dog, popular in Great Britain as a pet dog. In China it is killed and hung up for sale in the meat-shops. It has a piquant expression, is an intelligent companion, and a good house dog. Its chief peculiarity is that it has a black tongue. Occasionally the roof of the mouth is also black. Its coat should be all of one colour—black, red, yellow, blue, or white—but not in patches. White spots on the coat are a disqualifying point. The

hair under the tail and under the thighs is frequently of a lighter shade in the same colour. Other points to notice are: Head broad and flat; nose moderate in length, but short tipped; nose and mouth black; eyes small and dark; ears alert and carried erect and well over the eyes; neck broad and firmly set; legs strong, bony, and perfectly straight; feet round and cat-like; chest broad and deep. The C. has a deep ruff round the neck, and a hairy, full tail, curled over the back. It weighs from 46 to 55 lb.



CHOW-CHOW

T. Fall

Chree, Charles (1860-1928), physicist, b. Forfarshire and educ. at Aberdeen and Cambridge. Achieved distinction in the study of terrestrial magnetism (q.v.) and atmospheric electricity. From 1893 to 1925 he was superintendent at Kew Observatory, during which period it was developed into one of the best in the world. In 1897 he was elected fellow of the Royal Society. Pub. *Terrestrial Magnetism*, 1912.

Chrestien, Florent (1541-96), Fr. scholar and satirical poet, b. Orleans. He was one of the co-authors of the *Satyre Ménippée*, 1594, directed against the League. A composer of Lat. verse and a good Hellenist, he was chosen as tutor to the prince de Béarn, afterwards Henry IV.

Chrestomathy (Gk. 'good learning'), collection of the best extracts from any author or authors. The term is especially applied to such a compilation in a foreign language. An example from modern times is G. Paris's *Chrestomathie du moyen âge*, 1908.

Chrétien de Troyes (fl. c. 1170), Fr. medieval poet, b. Champagne. Little is known of his life, except that he wrote his *Lancelot* at the command of Marie, Countess of Champagne (after 1164), and his *Perceval* or *Le Conte del Graal* for Philip, Count of Flanders, who d. 1191. His other romances are *Erec*, c. 1165, *Cligès*, c. 1170, and *Yvain*, c. 1175, often considered his masterpiece. Whether Chrétien is the author of the poem *Guillaume d'Angleterre* is still a matter of controversy. The subject of his romances is always a love-story, set in a background

of King Arthur's court. Although it is not certain whether Chrétien had a didactic purpose, his poems all deal with a psychological problem, such as the compatibility of love and marriage, the extent of independence permissible in marriage, etc. Chrétien possesses a brilliant narrative technique and an equally brilliant style; he handles the traditional octosyllabic couplet with consummate skill. The incomplete *Conte del Graal* is probably the first work on the story of the Holy Graal, and leaves us with the possible hypothesis that in his old age Chrétien turned to religion. See W. Foerster and H. Breuer, *Kristian von Trojes' Wörterbuch*, 1914; A. Micha, *La tradition manuscrite des romans de Chrétien de Troyes*, 1939; G. Cohen, *Un grand romancier d'amour* (2nd ed., 1948); R. S. Loomis, *Arthurian tradition and Chrétien de Troyes*, 1949.

Chrisam (Gk. *chrismā*, a substance used in anointing, from *chrēin*, to anoint), consecrated olive oil mixed with balm, used by the Rom. Catholic Church for anointing in certain sacraments; in the Orthodox Church it is mixed with spices. Children are anointed before being baptised.

Chrisome, robe presented to infants when baptised in the Rom. Catholic faith, to symbolise innocence. It represents the original C. cloth which used to be placed on the head to prevent the chrism oil being rubbed off. A C. child is one who dies within a month after baptism, in which case the C. is used as a shroud (cf. Shakespeare's *Henry V*, ii. 3).

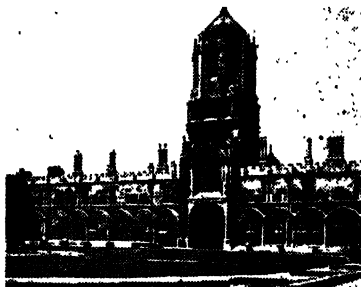
Christ, from Gk. for 'anointed', usually with the definite article, 'the anointed one, the Christ', and used in the Septuagint version of the O.T. to translate the Heb. *Mashiach*, Messiah, the anointed one, i.e. the great earthly King whom the Jews expected to restore their kingdom and free them from the subjection in which they were held, according to prophecy (see MESSIAH). In the N.T. it always refers to the claim of Jesus (q.v.) to fulfil the Messianic prophecies, but in a spiritual sense as the establisher of a spiritual kingdom and of freedom from subjection not to earthly rulers, but to sin. When He asks His disciple, 'Whom think ye that I am?' Peter answers, 'The Christ.' The high priest asks Him if He is 'the Christ,' and He says 'I am.' In the first epistle of St Paul to the Thessalonians, not later than AD 52, the Church is addressed as in 'the Lord Jesus Christ.' It may be noted that 'Christ,' alone with 'Jesus' or 'Lord Jesus,' is far more frequent in the Epistles and Acts than in the Gospels. From the earliest time it is the spiritual side of Jesus' mission as Messiah that is stressed, and it is plain how His followers came to be called 'Christians.' The first letters of the name in Greek, XP, formed the monogram of Constantine's *laborum*, replacing the Eagle, and have always remained a favourite symbol of Christian art.

Christ, Disciples of, or Campbellites, religious sect founded by Alexander Campbell (1788-1866). They do not

have any creeds or confessions; they take their religious ideas direct from the N.T., and baptise by total immersion. In the U.S.A. they had 7900 churches and 1,820,000 members in 1955.

Christ, United Church of, name under which the Congregational Christian churches in the U.S.A. and the Evangelical and Reformed Church (qq.v.) were merged in 1957.

Christ Church (Lat. *Aedes Christi*, popularly called 'The House'), Oxford, commenced by Cardinal Wolsey in 1525. The Church of St Frideswide became both the cathedral of the diocese and the college chapel. The foundation was first called



CHRIST CHURCH, OXFORD: FRONT QUAD
KNOWN AS TOM QUAD

Cardinal College, was suppressed by Henry VIII on the fall of Wolsey, and re-named 'King Henry VIII's College,' and in 1546 was estab. as it now exists with the legal title of 'The Dean and Chapter of the Cathedral Church of Christ in Oxford, commonly called Christ Church.' The foundation consists of the dean, 6 canons (of whom 5 are univ. profs. and the sixth archdeacon of Oxford), the students (equivalent to fellows in other colleges), the cathedral staff, and the scholars and commoners. The disciplinary officer (called deans in other colleges) are 2 of the students known as censors; 2 other students are known as the treasurer and the steward and perform the duties carried out in other colleges by the estates and domestic bursars respectively. The great gateway was carried up by Wolsey to the level of the parapet, and completed by Dr John Fell and Sir Christopher Wren in the 17th cent.; the cloisters in the Great Quadrangle ('Tom Quad.') were never completed. The tower of the gateway contains the great bell known as 'Tom' (St Thomas of Canterbury), which was formerly the clock bell of Osney Abbey.

The cathedral is small and cruciform; it was originally the priory church of St Frideswide and contains traces of Saxon work, but was restored and made Norman in 1160. The building contains specimens of every Eng. style. The nave roof is

woodwork; the choir is roofed with fan tracery in stone; there are some windows by Burne-Jones (q.v.) some 14th-cent. glass, and a curious Dutch window by Abraham van Ling, 1630. The cathedral contains many interesting tombs, including the shrine of St Frideswide.

Christ of the Andes, see **USPALLATA**.

Christadelphians (Gk. 'brethren of Christ'), sect founded by Dr John Thomas (b. London, 1804). They believe in the unity (but deny the Trinity) of God; in Jesus Christ b. of the Spirit of God and so the son of God, who d. as a sacrifice that men might have life; in immortality as a conditional gift at the resurrection of the dead on the return of Christ to establish a universal kingdom upon earth, when the centre of gov. will be in Palestine with Jerusalem as cap. See J. Thomas, *Elysis Israel*, 1850; R. Roberts, *Christendom A stray*, 1884; J. Carter, *God's Way*, 1947.

Christchurch, tn in Hants, England, situated at the junction of the Avon and Stour, on the edge of the New Forest, close to Bournemouth. It possesses a beautiful church, the priory church of the Holy Trinity, a cruciform edifice, without the central tower, and having a Perpendicular tower at the W. end. The nave and transepts are mainly Norman. The priory of C. is mentioned in Saxon documents as Twineham, and in 901 it was seized by Ethelwold (A.-S. Chronicle). About 1095 it was partially rebuilt and endowed by Ranulph Flambard, Bishop of Durham. It contains the poet Shelley's monument and many others of interest. The ruins, of a Norman castle, built by Richard de Redvers in Henry I's reign, are close to the church. The bor. was first summoned to send representatives to Parliament in 1307. Pop. 21,290.

Christchurch, largest city of the S. Is. of New Zealand, was intended from the outset by the Anglican founders of the Canterbury settlement, some of whom were Christ Church, Oxford, men, to be the cap. of the prov. dist. of Canterbury. It is situated on the Avon and Heathcote R.s and extends from the hills of Banks Peninsula to the sea. While the industrial and business areas and most of the residential dists. are on level land, there are many hillside suburbs and seaside resorts. The Avon and Heathcote R.s are small slow-flowing streams, ideal for rowing in the upper reaches and for small pleasure craft by the sea. C. is known as the 'Garden City' of New Zealand, being celebrated for the many fine parks and open spaces, boulevards and riverside reserves. Canterbury Univ. College includes an engineering school with a world famous reputation. The Anglican cathedral in the centre of the city (Cathedral Square) is one of the finest buildings of the kind in the S. hemisphere. The museum contains many exhibits of interest, including the bones of the moa (q.v.) and the finest collection of New Zealand stamps, bequeathed by Sir Heaton Rhodes in 1956. The largest of the many parks, known as Hagley Park, comprises just under 500 ac. The city, as the commercial centre of the rich

Canterbury Plains, is highly industrialised and contains many industries connected with both primary and secondary production. It is rapidly becoming the chief manufacturing centre of New Zealand because of the unlimited facilities for expansion, the wide streets and highways radiating in all directions, and its fine international aerodrome. Lyttelton, the port of C., is approached by road and rail, the latter being a direct route through the tunnel in the hills to the port only 7 m. from the heart of the city. A tunnel road is planned to give the city additional access to the port. Pop. of the city (urb. area) 193,182.

Christening, see **BAPTISM**.

Christian, name of sev. kings of Denmark and Norway:

Christian I (1448-81), b. 1426. He was also King of Sweden (1457-64), and was elected Duke of Schleswig-Holstein (1460). He was the first Oldenburg king of Denmark.

Christian II (1513-23), b. 1481, King of Denmark, Norway, and Sweden, son of King John of Norway and Denmark and Christina of Saxony, married Isabella of Burgundy. On his accession the Swedes refused him as king, and, headed by Sten Sture, held out against him for some time, but were finally defeated at Upsala, 1520. After the heads of the nation had sworn fealty, he gave a banquet and had most of his guests seized and imprisoned. About 82 persons were executed or drowned by his order the following day (the Stockholm massacre). Sweden revolted successfully, while his system of taxation made him hated by the nobility in Norway and Denmark. Jutland revolted and gave the Dan. crown to Frederick of Holstein in 1523. After a long struggle C. was compelled to surrender to King Frederick in 1532, and was kept in solitary confinement for 27 years. He d. in 1559.

Christian III (1535-59), b. 1503, son of Frederick I. The year after his accession Lutheranism was estab. as the state religion in Denmark. C. made successful alliances with various Ger. states to protect himself from imperialist threats, and during his reign Denmark enjoyed great material prosperity.

Christian IV (1588-1648), b. Fredriksborg, Zealand, in 1577. In 1611-13 he waged war with Gustavus Adolphus of Sweden, which terminated in the peace of Knärod. During the Thirty Years War he was crushingly defeated by Tilly (1626) at Lutter-am-Barenberge and Jutland was raided by the enemy's troops. He again fought with Sweden from 1643 to 1645, and by the peace of Brömsebro was obliged to yield a great part of his ter. around the Sound. C. IV was, however, a popular king. He was energetic in promoting commercial enterprise and encouraged science and industry, and his foreign policy, though a failure, had the support of his people. He founded Christiania, the present cap. of Norway, in 1624 (now named Oslo).

Christian V (1670-99), b. 1646, was a generally incompetent ruler. The war

with Sweden, 1675-9, greatly weakened Denmark. During his reign Denmark acquired the is. of St Thomas and St John in the W. Indies.

Christian VI (1730-46), b. about 1699.

Christian VII (1766-1808), b. 1749, son of Frederick V and Louise, daughter of George II of Great Britain. He was feeble-minded, and was dominated by his ministers, Bernstorff and Struensee. He married Caroline Matilda, sister of George III, who was subsequently accused of committing adultery with Struensee, and sent back to England after the latter's execution. After 1784 his son Frederick (later Frederick VI) ruled as regent.

Christian VIII (1839-48), b. 1786.

Christian IX (1863-1906), b. 1818. He was closely connected by marriage with many of the thrones of Europe. His daughter, Alexandra, married Edward VII of England; another, Dagmar, married Tsar Alexander III; while his second son, George, became King of Greece (1863). His grandson became King of Norway as Haakon VII, 1905. In 1864 C. lost Schleswig-Holstein in war with Austria and Prussia, and his reign was notable for the growth of Socialism in Denmark. He was succeeded by Frederick VIII.

Christian X (1912-47), baptised with the additional names Carl Frederik Albert Alexander Vilhelm, King of Denmark and Iceland, was b. at Charlottenlund, 26 Sept. 1870; son of Prince Frederik, later Frederick VIII, and of Princess Louise of Sweden and Norway. He joined the army, and rose to be major-general. He married Alexandrine, Duchess of Mecklenburg-Schwerin, in 1898; in 1906 he became crown prince; and he succeeded to the throne of Denmark and its dependencies on the death of his father, 14 May 1912. The chief features of his reign were: the co-operation (beginning with the meeting at Malmö in Sweden, 18 Dec. 1914) of Sweden, Norway, and Denmark, as neutrals during the First World War; the enfranchisement of women as part of a new constitution granted in 1915; the erection of Iceland into a separate kingdom under the same head on 1 Dec. 1919; and the re-acquisition of N. Slesvig from Germany at the end of the war. During his reign he made a number of visits to Iceland, and he also went to Greenland, being the first Dan. monarch to do so. When an Icelandic rep. was declared in 1944, he sent the Icelandic Gov. a generous message of goodwill. C. will be remembered by the Dan. people for the courage with which he upheld his people's rights during the Ger. occupation of Denmark, 1940-5. So far as he was able he maintained a show of independence in his relations with the Germans, but he continued on the throne on sufferance. Nevertheless he provided in his person a rallying point for Dan. patriotism and sentiment, and the fervour with which he was acclaimed when he appeared in public bore witness to his popularity with his subjects, which never waned.

Christian, Prince, Frederick Christian Charles Augustus (1831-1917), prince of Schleswig-Holstein-Sonderburg, son of

Duke Christian August. In 1866 he married Princess Helena Augusta Victoria, third daughter of Queen Victoria, and helped her a great deal in her philanthropic work.

Christian, follower of Christ. According to Acts xi. 26, 'the disciples were called Christians first in Antioch,' about the year 43. The word only occurs in 2 other places in the Bible (Acts xxvi. 28 and 1 Peter iv. 16). It was at first a contemptuous nickname given by the Pagans (cf. Tacitus, *Annal.* xv. 44). The name could not have originated among the Jews, who called the disciples Nazarenes and Galileans and would not have given them a name which meant 'followers of the Anointed.' See CHRISTIANITY.

Christian Brothers, Rom. Catholic educational institute, founded at Waterford, Rep. of Ireland, in 1802 by Edmund Ignatius Rice. Rice had resided in that city as a merchant since 1780, and his pity had been excited by the deplorable state of ignorance and vice in which the poor lived. In 1803 a monastery was built for his school by the citizens of Waterford. Rice received the support of the Bishop of Waterford, and was before long asked to open houses of the institute in many tns of Ireland. There are now 200 schools of the C. B. in Ireland, England, Australia, India, and N. America. In 1820 the were granted a constitution by the H^o of Commons, and confirmed as a religious institute of the Rom. Catholic Church. When the Irish national system of education was estab. (1831), the C. B. for a time accepted the grant by placing their schools under the Board, but they later withdrew from the connection as they could not separate secular from religious teaching. The title has erroneously been given to the Brothers of the Christian Schools, a brotherhood of laymen bound by 3 religious vows, founded by St J. B. de la Salle for the education of the poor, in France (1684). The training college estab. at Rheims in 1685 was the first of its kind in the world. There are now, in all parts of the world, about 300,000 pupils of the brotherhood. The system of elementary education given by these Fr. schools was adopted by Rice in drawing up the rules for his Irish institute.

Christian Connection, sect for banding together Christians who have no definite creed. They take the Bible as the foundation of their belief and conduct. They were founded in America in the early part of the 19th cent. Their views are much the same as those set out by Chillingworth in *The Religion of Protestants a Safe Way to Salvation*, 1637.

Christian Endeavour. The Christian Endeavour (C. E.) movement originated in Williston Congregational Church, Portland, Maine, U.S.A., in 1881. It was formed by Dr Francis E. Clark, who later became the first world president. The movement was formed to hold and train young Christians in and for the Church. Its motto 'For Christ and the Church' indicates its supreme purpose. The success of the first society led to the extension of the movement in other

churches, not only in America but throughout the world. While its emphasis is upon the devotional life, it seeks to train young people to apply their faith to every aspect of life; thus, through its weekly topics, it focuses attention upon the missionary spheres and Christian citizenship. Its work is interdenominational, not undenominational, and is found in all the evangelical denominations of the Church, where it enjoys full recognition. It is international, having been estab. in Canada (1883), India (1883), China (1885), Great Britain (1887), S. Africa (1887), Australia (1888), France, Spain, Burma (1888), Turkey (1889), Sweden (1890), Jamaica, New Zealand (1891), Japan (1893), Germany, Switzerland (1894), etc. In each country the work is controlled by a national C. E. union, which has local unions to cover its constituency. The whole is co-ordinated in the world's C. E. Union. While the local society is pledged in its first loyalty to the church with which it is attached, its fellowship extends to all similar societies. Societies are graded according to age groups, thus its membership reaches from childhood to ripper years. As a pioneer of Christian youth work it is still virile and active throughout the world.

Christian Knowledge, Society for Promoting, founded in 1698 by 4 laymen, Lord Guilford, Sir Humphrey Mackworth, Mr Justice Hook, and Col. Colchester, and 1 parson, Dr Thomas Bray (q.v.), who met, probably in Hook's chambers in Lincoln's Inn, to discuss the provision of church schools in London parcs, the catechising of the children of the poor, the conversion of Quakers, and Dr Bray's scheme for promoting religion in the plantations (colonies). The directing mind was that of Bray (1638-1740), rector of Sheldon, near Birmingham. Appointed commissary to Maryland by Compton, Bishop of London, he estab. lending libraries in that settlement and, later, at home. As a result of his preoccupation with the ecclcs. affairs of Maryland, he drafted *A General Plan of the Constitution of a Protestant Congregation of Society for Propagating Christian Knowledge*. This document is preserved in the library of Sion College. Bray's original scheme contemplated a 'congregation pro Propaganda Fide,' a society incorporated by royal charter, consisting of clergy and laymen who 'should meet and consult upon the best means and methods of promoting religion and learning in any part of His Majesty's plantations abroad'; to supply and support a missionary clergy; and to establish parochial libraries throughout the plantations; and further, in order to arrest 'the terrible decay of religion in this kingdom,' they were to provide clerical lending libraries in mkt tns and 'set up catechetical schools for the education of poor children in reading and writing and especially in the principles of the Christian religion.' This was an ambitious project and, after Bray's return from Maryland, it was evident that the work was more than a single society could cope with; and the result was that, while

the S.P.C.K. continued to work with no restrictive charter, a separate society for the propagation of the gospel in foreign parts was founded in 1701, with a royal charter. To both societies, founded by Bray, the Anglican Communion owes a great debt. As a church publishing society the S.P.C.K. exercised great influence in moulding clerical opinion in the period when convocation was suppressed. Among the earliest works circulated by the S.P.C.K. were Bray's *A Discourse upon the Baptismal Covenant* and the controversial pamphlets of George Keith, a convert from Quakerism. The society also pub. tracts addressed to particular classes of the pop.: *The Husbandman's Spiritual Companion*, *The Christian Soldier*, *Serious Advice and Warning to Servants*, more especially those of the *Nobility and Gentry*. But its prin. pubs. were cheap reprints of standard works by Anglican divines—Burnet, Hopkins, Lowth, and others—particularly those bearing upon the prayer-book and catechism. To this day the S.P.C.K. is regarded primarily in terms of its publishing, for it publishes books of first-rate theological and historical scholarship both under its own imprint and also that of the Church Historical Society. It also supplies vernacular prayer books for the Church overseas, maintains a large overseas publishing programme, and operates 50 bookshops in different parts of the world. But this limited viewpoint ignores much of the society's hist. It was the originator of the charity school movement in the 18th, and of the National Society for Promoting Religious Education in the early 19th cent. It was a pioneer in the foundation of church training colleges at home and overseas. It endows scholarships, studentships, and bursaries in many lands. Under the aegis of the society are the Religious Drama Society and the Church of England Films Commission. It sponsored missionary work in S. India. has financed the training of medical missionaries for all the missionary societies of the Church of England and has helped to endow overseas bishoprics. Address: S.P.C.K., Holy Trinity Church, Marylebone Road, N.W.1.

Christian Science, name given by Mrs Mary Baker Eddy (q.v., 1821-1910) to a system of metaphysical healing based on the Scriptures, the divine Principle of which Mrs Eddy declares she discovered in 1866, and later elucidated and gave to the world in the textbook of the C. S. movement, *Science and Health with Key to the Scriptures*. This remarkable vol., which is Mrs Eddy's prin. work, was first pub. in 1875. *Science and Health* is said so to illuminate the Scriptures as to enable those who understand it to repeat in a degree at least the healing and regenerating works of the prophets and of Jesus and the apostles. C. S. accepts the first chapter and the first 5 verses of the second chapter of Genesis as representing the true account of creation, the account beginning at the sixth verse of the second chapter being regarded as untrue. C. S. accepts Christ Jesus as the Saviour of

the world from sin, sickness, and death, and the Way-shower to eternal life. It distinguishes between Jesus of Nazareth, the son of Mary, and the Christ, the spiritual Son of God. In her *Message to The Mother Church* for 1901, Mrs Eddy wrote: 'The Christ was Jesus' spiritual selfhood; therefore Christ existed prior to Jesus who said: "Before Abraham was, I am."' Jesus, the only immaculate, was b. of a virgin mother, and C. S. explains that mystic saying of the Master as to His dual personality, or the spiritual and material Christ Jesus, called in Scripture the Son of God and the Son of man—explains it as referring to His eternal spiritual selfhood and His temporal manhood. In the first chapter of Genesis it is declared that man is made in the image and likeness of God. Christ Jesus' statement, 'that which is born of the Spirit is spirit' (John iii. 6) conforms to this. The world in general, however, has accepted the second or false account of the creation of man from the dust of the ground. C. S. claims to teach men how to overcome the false sense and replace it with the truth which Christ Jesus said would make men free. C. S. declares that God is Spirit, that He is good, and that He is the only creator. This being the case, only the spiritual and the good are real and eternal. The spiritual and good being all, there is in reality no place for evil, sin, disease, and death. Therefore the latter have only a supposititious existence. C. S. does not deny that evil seems real, but maintains that this seeming disappears in the proportion that the truth, which destroys error, is apprehended. The application and effect of this exact, spiritual thinking C. S. declares to be that which Jesus meant when He said: 'Ye shall know the truth, and the truth shall make you free.' C. S. healing, according to its adherents, is brought about by the operation of Truth in human consciousness and not, as some believe, by mental suggestion, psychotherapy, or other form of human will-power.

The first C. S. church was organised in Boston, Massachusetts, in 1879. From this beginning C. S. has circled the globe with a chain of churches numbering over 3000 branch churches and societies as well as 99 univ. organisations. C. S. organisations may now be found in every country of the civilised world. At the head of these is the Mother Church in Boston, of which Mrs Eddy was the first pastor, and in later years the pastor emeritus. All C. S. churches are branches of this Mother Church, officially known as the First Church of Christ, Scientist. The affairs of the Mother Church are administered by a board of directors of 5 members. The duty of the directors is to administer the affairs of the denomination under the by-laws framed by Mrs Eddy. This authority is vested in them by section 6 of Article 1 of the Church Manual as follows: 'The business of the Mother Church shall be transacted by its Christian Science Board of Directors.' No adequate estimate of the number of Christian Scientists in the world to-day is obtainable,

but in 1936 there were 2113 churches and 269,000 communicants in the U.S.A. and to-day the First Church of Christ, Scientist, in Boston, claims to have 333 branch churches and societies in Great Britain and Ireland. There are over 8000 practitioners throughout the world who give their entire time to C. S. healing. Many remarkable cures have been attributed by its adherents to C. S. who claim that these cures have included diseases and deformities considered by the medical profession to be incurable.

The pubs. of the movement issued by the C. S. Publishing Society, Boston, Massachusetts, include periodicals in various languages besides *The Christian Science Monitor* (daily). See Sybil Wilbur, *The Life of Mary Baker Eddy*, 1907; E. M. Ramsey, *Christian Science and its Discoverer*, 1923; L. Powell, *Mary Baker Eddy: a Life-size Portrait*, 1930; C. Smith, *Historical Sketches from the Life of Mary Baker Eddy and the History of Christian Science*, 1941, and *The Story of Christian Science Wartime Activities, 1939-1946*, 1947; I. Tomlinson, *Twelve Years with Mary Baker Eddy*, 1945; Julia Johnson, *Mary Baker Eddy: her Mission and Triumph*, 1946; W. D. Oront, *Mary Baker Eddy and her Books*, 1950; Norman Beasley, *The Cross and the Crown: the History of Christian Science*, 1953; also *We Knew Mary Baker Eddy* (1st series, 1943; 2nd series, 1950; 3rd series, 1953) and books by Mary Baker Eddy (q.v.).

Christiania, see OSLO.

Christianity, the teaching of Jesus Christ as found in the N.T., together with the whole body of doctrine and institutions based thereon. See ACTS OF THE APOSTLES; APOSTLES; APOSTOLIC FATHERS; ATONEMENT; BAPTISM; BIBLE; CANON LAW; CHRIST; CHURCH; CHURCH HISTORY; CHURCHES IN THE U.S.A.; CLERGY; CREED; EASTERN ORTHODOX CHURCH; ENGLAND, CHURCH OF; EUCHARIST; FAITH; FALL, THE; FATHERHOOD, THE DIVINE; FATHERS OF THE CHURCH; GOSPELS; GRACE; HEAVEN; HELL; HERESY; HOLY GHOST; INCARNATION; JESUS; JUDGMENT, THE FINAL; MARY, THE BLESSED VIRGIN; MESSIAH; NONCONFORMITY; ORDERS, HOLY; ORIGINAL SIN; PAPACY; RELIGION; RESURRECTION; REVELATION; ROMAN CATHOLIC CHURCH; SACRAMENTS; SACRIFICE; THEOLOGY; TRINITY; and the numerous articles there referred to. See also E. Bevan, *Christianity*, 1932; K. S. Latourette, *The Expansion of Christianity*, 1945, and *The Prospects for Christianity*, 1949.

Christiansborg, former Dan. fort and settlement in Ghana near Accra (q.v.). It was ceded to Great Britain by the Danes in 1840. The fort is the official residence of the Governor-General of Ghana.

Christiansfeld, small tn in S. Jutland, Denmark. It was founded by Moravians (q.v.) in 1773. Pop. 800.

Christianshavn, see COPENHAGEN.

Christiansted, cap. of the formerly Dan. W. Indian is. of St Croix which was sold to the U.S.A. in 1917. Pop. 4126.

Christie, Agatha (1891-), novelist, b. Torquay, her maiden name being Agatha

Mary Clarissa Miller and her father an American. Educ. privately and in Paris, in 1914 she married Archibald Christie, who became a colonel in the First World War, during which she worked as a V.A.D. in a Torquay hospital. In 1920 she wrote her first detective story, *The Mysterious Affair at Styles*, introducing her famous Belgian detective, Hercule Poirot, who scorns the traditional clue-hunting and pins his faith to psychology and the 'little grey cells' of his brain. Further Poirot mysteries followed, and in 1926 *The Murder of Roger Ackroyd* caused a sensation by making the narrator of the story the criminal. In the same year the authoress gained publicity through being reported missing and finally discovered at a Yorks health resort suffering from loss of memory. In 1928 she divorced her husband and in 1930 married Max Edgar Lucien Mallowan, an archaeologist, whom she later accompanied on many of his expeditions. She is perhaps the most successful writer of detective fiction after Conan Doyle, and her books are extremely popular. Among the best known are *The Mystery of the Blue Train*, 1928, *The Seven Dials Mystery*, 1929, *Murder at the Vicarage*, 1930, *Lord Edgware Dies*, 1933, *The ABC Murders*, 1936, *Ten Little Niggers*, 1940, *The Body in the Library*, 1942, and *A Murder is Announced*, 1950. A number of these were dramatized, and in 1954 she enjoyed the unique distinction of having 3 mystery plays running simultaneously in W. End theatres. See also DETECTIVE STORY.

Christie, Alexander (1807-60), painter, b. Edinburgh. He studied art there and was teacher in the Edinburgh School of Art, 1843, and an associate of the Royal Academy in 1848. His best-known picture is 'An Incident in the History of the Great Plague,' and he also illustrated the Abbotsford ed. of Scott's *Bride of Lammermoor*.

Christie, James, the Elder (1736-1803), auctioneer of London. He held his first sale on 5 Dec. 1766, and the exhibitions of the Royal Academy used to be held on his premises in Pall Mall until 1779. He subsequently moved next door to Gainsborough at Schomberg House.

Christie, James, the Younger (1773-1831), auctioneer and antiquary. He carried on the business of his father, and moved to 8 King Street, St James's Square, London, in 1824. The full title of the firm is now Christie, Manson, & Woods Ltd (see CHRISTIE'S). C. wrote sev. works, among which are *An Inquiry into the Antient Greek Game* (i.e. chess), 1801, *Etruscan Vases*, 1806, and *Greek Vases*, 1825.

Christie, Samuel Hunter (1784-1865), mathematician and physicist, b. Twickenham, son of James C. the Elder. He took his B.A. degree at Cambridge in 1805, and was second wrangler. From 1808 to 1854 he taught maths at Woolwich Military Academy, becoming prof. there in 1838. He wrote many articles for the Royal Society on the effects of temp. and the solar rays on the magnetic needle, and also on the conductivity of metals.

was then appointed prof. of materia medica (q.v.), retiring in 1877. In 1829 he pub. his classical *Treatise on Poisons* and was appointed a medical officer to the Crown. He gave professional evidence in many notable cases, including that of Burke and Hare (see RESURRECTIONISTS). In 1848 he became physician to the queen. He was chairman of the General Medical Council committee responsible for the preparation of the first pharmacopoeia of Great Britain and Ireland, 1864. He was for sev. years editor of the *Edinburgh Medical Journal*. C. was created baronet in 1871. He made outstanding contributions to toxicology and pharmacology; he wrote a monograph on the pathology of the kidneys, 1839. See life, ed. by his sons, 1885.

Christlieb, Theodor (1833-89), Ger. theologian, b. Birkenfeld, Württemberg; gave up his ministry at the Ger. Protestant Church in Islington, London, to take charge of a par. in Friedrichshafen. In 1868 he became prof. at Bonn. He wrote *Modern Doubt and Christian Belief*, 1868.

Christmas (*Cristes masse*, the mass of Christ), the conventional anniversary of the nativity of Christ, celebrated in Europe on 25 Dec. On this day, in the Rom. Catholic Church, every priest is entitled to say 3 masses: at midnight, at dawn, and later in the morning. The beginning of the celebration of C. cannot be exactly dated. References to it as flourishing in the time of Telephorus (AD 138-61), are probably spurious, and the first certain mention of the festival is under the Emperor Commodus (AD 180-92); it is mentioned in the 3rd cent. by Clement of Alexandria. Diocletian, learning that Christians were celebrating the anniversary of the founder of their religion, fired the church, and all the worshippers perished in the flames. The early Church had no fixed date for C.; by some it was observed in May, by some in Jan., and by others concurrently with Epiphany. It is, however, unlikely that 25 Dec. was the actual date of Jesus' birth. The choice of this season may be due to the general recognition that the winter solstice was the turning-point of the year; all things seem to prepare then for a fresh period of life and activity after the winter sleep of death. The Rom. festival of the winter solstice was celebrated on 25 Dec. (*dies natalis solis invirti*). The Celtic and Germanic tribes held this season in veneration from the earliest times, and the Norsemen believed that their deities were present and active on earth from 25 Dec. to 6 Jan. Many other auct. beliefs and customs about this period have been handed down to our times, and have crept into Christian usage. The lighting of the Yule log, a custom once widely prevalent, was derived from Lithuanian folklore. The practice of decorating houses and churches is pagan in its origin, and the mistletoe so widely used for that purpose was the sacred plant of the Druids. The custom of presenting friends with gifts at C. dates back to the time of the auct. Romans. In Italy, however, it is attached rather to Epiphany, in commemoration of

the gifts of the Wise Men. In Scotland, in the 15th cent., the Yule celebrations lasted from 18 Dec. to 7 Jan. The latter date was termed *Uh-halie Day*, and within the period of the celebrations 'Yule Girth' was proclaimed over all the country, and the worst of miscreants enjoyed sanctuary, as no court had the right to punish them. The 'Up-Holly-Aa' of the Shetland Is. is a relic of this auct. custom. It was, however, the aim of the Christian Church to ennoble and lift above their heathen associations all the customs that survived from bygone ages, and with this end the liturgy was framed, and many dramatic representations of the birth and early life of Christ were instituted. Hence the so-called manger-songs, C. carols, special dishes for C., etc. During the Middle Ages and later, the customs practised at C. time, and the legends associated therewith, were exceedingly numerous; most of them have now become obsolete. The C. tree, a young spruce-tree, still survives; some trace its origin to the Rom. saturnalia as indicated by Virgil's supposed allusion in the line 'Oscilla ex alta suspendent mollia pinu' (*Georgics*, ii. 389); but it probably dates from the time of St Boniface, the apostle of Germany (AD 680), who is said to have substituted for the sacrifices to Odin's sacred oak a fir-tree adorned in honour of the Christ child. It is said that Luther introduced the C. tree lighted with candles. It was introduced into England from Germany in the reign of Queen Victoria. Father C., who is supposed to come down the chimney and place gifts in the children's stockings that are suspended by the fire-place or the bed, has a parallel in every European country. He is variously identified with St Nicholas (Santa Claus), Robin Goodfellow, Knecht Ruprecht, and the Father Bonhomme Noël. St Nicholas's Day is on 6 Dec. The social festivities of the season were formerly kept up uninterruptedly for over a week; now C. Day and Boxing Day only are general holidays. The custom of giving gratuities to servants, etc., at C. is also Roman in its origin. The Romans named such gifts *strenae*, and they are called boxes from the fact that boxes used to be hung up in church at C. time for offerings to be dropped therein for the poor and needy of the par. These boxes were opened on the day after C. Day and their contents distributed; hence the day was known as Boxing Day, and the gifts themselves came to be known as C. boxes. Public servants formerly received C. boxes, but this was discontinued about 1840. C. cards, now so universally used, were instituted in 1846. In Scotland, C. is not kept as a universal special holiday, New Year's Day taking its place; the Presbyterian Church, therefore, has no special services for C. Day. Hansel Monday, the first Monday of the New Year, is the equivalent of Boxing Day in Scotland, and in the more northerly parts of England. See Brand, *Popular Antiquities*, 1870; A. Tille, *Yule and Christmas*, 1899; W. F. Dawson, *Christmas and its Associations*, 1901; C. C. Polhill, *Christmas in Ritual and Tradition*, 1925; D. B.

Wyndham Lewis and G. C. Heseltine, *A Christmas Book*, 1928.

Christmas Island: 1. Is., never more than 12 m. long and 9 m. broad, in the E. part of the Indian Ocean, 190 m. S. of Java. Area 62 sq. m. C. I. is a Brit. possession under the gov. of Singapore. Deposits of phosphate of lime, the result of the continuous action of the dung of sea-fowl on the chalk below, give the is. its one commercial value. C. I. is really the top of a submerged mt, some 15,000 ft high, of which only 1200 ft rise above the surface of the sea. It was visited by Dampier in 1688 and was annexed in 1889, being then uninhabited. Pop. about 1300, employees of the Phosphate Co. Most of the houses on the is. have electric light and running water. There are 11 m. of railway and 8 m. of road. A wireless station was installed in 1923. The is. was occupied by the Japanese during the Second World War.

2. Is. (with a 90-m. circuit) in Polynesia, Pacific Ocean, lies a little above the equator, S. of Honolulu. It is attached to the Gilbert and Ellice Is. (q.v.) colony, and lies in 1° 59' N. lat. and 157° 30' W. long., and about 160 m. ESE. of Fanning Is. Discovered by Cook in 1777, it was annexed by Great Britain in 1898 with a view to laying the Pacific cable, of which Fanning Is. is a station. Since 1952 the dist. officer in charge of Line Is. dist. of the Gilbert and Ellice Is. colony (Washington, Fanning, and C. Is.) has had his H.Q. at C. I. and managed the copra plantation there. The is. was chosen as the site of the 1957 Brit. H-bomb tests. Area 60,000 ac. (12,000 ac. under coco-nuts). Pop. 50.

Christmas Rose, also known as the **Black Hellebore**, is *Helleborus niger* (family Ranunculaceae), a herbaceous perennial, winter-green and flowering late Dec. to Feb.; native to Central and S. Europe and W. Asia, introduced to Britain early in the 17th cent. Leaves are leathery, dark green, pedate with 7-9 lobes; the flowers, resembling a single rose, are saucer-shaped with 5 white or tinged rose sepals, yellow nectaries, and many stamens. The blackish rhizome and roots were once considered of medical value in mental derangement, hysteria, and melancholia, but are little used to-day; they contain a principle that is bitter, acrid, and slightly toxic. See also HELLEBORE.

Christophe, Henri (1767-1820), Negro King of Haiti. Originally a slave of Grenada, he became a chief under Desalines, Emperor of Haiti. After the latter's murder he estab. himself as King of the N. Civil war followed, but he was declared king in 1812. His cruelty caused a revolt, and to escape imprisonment he shot himself. A bronze plaque on his tomb is inscribed 'Ci-gît le Roi Henri Christophe, né le 6 Octobre, 1767, mort le 20 Octobre, 1820, dont la devise fut: Je renaîs de mes cendres.'

Christopher, St., early martyr of whom nothing else is known, but whose feast is on 25 July. His renown is due to legend rather than to fact. The representation of him in art with the infant Christ upon

his shoulder is founded on the story that a little child once asked C., who was of imposing stature, to carry him over a bridgeless stream. Staggering across, the bearer cried out against the strange heaviness of his load, but the boy replied: 'Marvel not, for with Me hast thou borne the sins of the whole world.'

Christopher I. King of Denmark (1252-1259), succeeded his brother, Abel. He was obliged to make over the rich duchy of Schleswig to his nephew, Valdemar, thereby beginning the series of dissensions over the Crown lands. When C. imprisoned his prime, Jakob Erlundsen, like a common felon, because of his devotion to the Pope and contempt for his own authority, he was excommunicated, but C.'s sudden death (probably by poison) put an abrupt end to the dispute.

Christopher II. King of Denmark (1319-1332), made repeated and eventually successful attempts to secure the duchy of S. Jutland (Schleswig), which had fallen to a minor. During his reign the royal prerogative was considerably curtailed, and the privileges of the aristocratic party strengthened. His reign was disturbed by internal rebellions, and the virtual dissolution of the kingdom at his death into the Scanian prov., Schleswig, E. Denmark, and Jutland and Fünen, demonstrates the weakness of his rule.

Christopher III (1418-48), King of Norway and Sweden, besides Denmark. C. owed his accession (1440) to the Rigtsraad. In his reign the condition of the peasantry further deteriorated, and in Jutland, after their rising of 1441, the peasants were reduced almost to the condition of serfdom.

Christopoulos, Athanasios (1772-1847), Gk poet, b. Custoria, Macedonia; studied at Buda and Padua, and from 1811 assisted Prince Caradja, hospodar of Moldavia and Wallachia, in making a code of laws for his country. When Caradja fell he lived in retirement and composed his lyrics and drinking songs which earned him a wide popularity. Besides translating Homer and Herodotus into modern Greek, he wrote *Politika Parallela*, on different forms of gov., a tragedy, and some philological works.

Christ's College, Cambridge, founded in 1505 by Lady Margaret Beaufort, mother of Henry VII. On the site of C. C. had stood 'God's House,' founded in 1436 by Wm Byngham. Henry VI gave the new foundation his royal charter on 16 April 1448. It was revived as C. C. by Lady Margaret Beaufort, who declared herself to be heir to all King Henry's godly intentions, and in the letters patent of Henry VII, dated 1 May 1505, Henry VI is recognised as founder of this new but continuing college. Part of the building was refaced in the 17th cent. It is not known for certain who was the architect of the fellows' building in the second court, a fine example of the Palladian style. One side of a third court was erected in 1888 by J. J. Stevenson, and 2 further sides added 1949-53 by Prof. A. E. Richardson. Among C. C.'s famous alumni are Bishop John Fisher, John

Chronometer, a portable timekeeper (see **HOROCLOGY**) provided with the spring detent escapement. Shipping losses, due to the inability of mariners to determine their long, with any degree of accuracy when out of sight of land, caused such anxiety that from 1714 the Brit. Gov. offered a series of rewards ranging from £10,000 to £20,000 for any generally practicable and useful method of finding the long, at sea. In order to obtain the highest award the method had to be accurate to within half a degree—i.e. to about 30 m. An official body known as the Board of Long, was set up to deal with the many and sometimes fantastic schemes that were submitted. Fifty years later the prize was won by an accurate marine timekeeper, the invention of John Harrison (q.v.).

Harrison succeeded with his fourth timekeeper. His first 3 were large, cumbersome, and complicated pieces of mechanism. Each was different from the others in many respects. By 1757 his 'Number 3' was so nearly finished that Harrison notified the Board of Long, that he proposed to compete with it for the £20,000 reward, and he suggested that at the same time he should put in hand a much smaller timekeeper to serve as an auxiliary to it. With the help of his son Wm he constructed his celebrated 'Number 4' which, according to Commander R. T. Gould, is the most famous timekeeper which has ever been, or ever will be, made. This is really a large centre seconds watch, 5 ft 2 in. in diameter, fitted with a greatly improved version of the verge escapement (see **CLOCK**) and a remontoir, wound every $7\frac{1}{2}$ sec. by the mainspring, through the lever. When tried it proved to be at least as good a timekeeper as Number 3, with the additional advantage of being much more portable, and Harrison decided to use it instead of Number 3. Its first official trial took place in 1761 on a voyage to Jamaica, when after 6 weeks at sea it was found to be 5 sec. slow, an error representing $1\frac{1}{2}'$ of long.—i.e. less than 1 geographical mile in that lat. Shortly after Harrison's success great strides were made in the development of marine timekeepers, notably by 2 world-famous Eng. watch-makers, John Arnold and Thomas Earnshaw (qq.v.). Arnold concentrated more on improving the compensation balance and balance spring. He introduced the helical spring. Earnshaw went much further and not only devised the spring detent escapement, substantially as it stands to-day, but created the type which all succeeding C. makers have followed.

The spring detent escapement is the most highly detached form of escapement used in a portable timekeeper. This means that the interference caused to the 'free' vibrations of the balance by the escapement itself is less in this form than in any other; it is a great advantage. Further there is no need for oil on any part of the spring detent escapement, other than the pivots, and consequently changes of temperature have less effect;

moreover there is less change of rate due to the oil drying or dispersing with time. It is a single beat escapement; the escape wheel is unlocked and impulse imparted at each alternate swing of the balance. It is not self-starting, like the lever, for example; should the movement stop, say through being run down, the balance must be turned to start the C. in motion again. Wear is usually negligible, and many of these escapements have seen more than 100 years of continuous use. The balance is similar to that employed in good watches, but heavier. It may be bimetallic, and provided with a steel, palladium alloy, or other spring; or it may be monometallic with an appropriate spring of low thermo-elastic co-efficient, e.g. Elinvar. Many variations of balance have been used in C.s, most of them fitted with 'auxiliaries' for compensation of what is known as the 'middle temperature error.' The balance spring is of helical type.

Although pocket C.s have been made, they have not been used extensively because the fact that it is a single beat escapement makes it prone to 'set' and stop if it receives a jar.

A modern C. is set out rather like a large full-plate watch. The balance carries 2 rollers, 1 with an impulse jewel and 1 of smaller diameter with a discharging jewel. The detent carries a locking jewel and also a gold spring. As the balance rotates in one direction the discharge jewel first strikes the tip of the gold spring, thereby displacing the detent to unlock a tooth of the escape wheel. Another, following tooth of the escape wheel then overtakes and strikes the impulse pallet, thereby imparting impulse to the balance. As the balance makes its return swing, the discharge pallet merely displaces the gold spring and the detent holds the escape wheel locked.

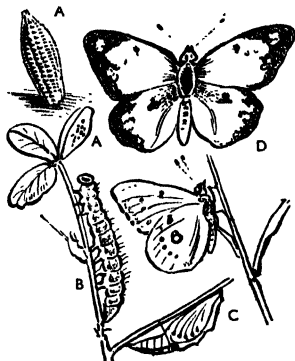
The movement is fitted into a heavy brass box (or bowl) to which the bezel is screwed. A pipe is secured to the top place of the movement around the winding square in order to exclude dust; the pipe extends to a hole in the brass box and the hole is covered by a brass shutter. The brass box is generally accommodated in a specially designed wood box made in 2 sections; the lower part containing the C. can be kept locked while observations can be made by lifting the lid and looking down through a glass window. Gimbals are provided in order to maintain it in a horizontal plane.

Chronometer, in music, see **METRONOME**.
Chrudim, Czechoslovak tn in the region of Pardubice (q.v.), on the Chrudimke. It has a noted horse market, and manufs. sugar, alcohol, and fertilisers. Pop. 13,300.

Chrypffs, see **CUSA**, **NIKOLAS OF**.

Chrysalis, or **Chrysalid**, term applied to the pupa of an insect, but especially to that of a butterfly or moth. It is essentially the resting stage of the creature's life, when, the larva having stored up much food, the perfect insect is built up from the disintegrated tissues.

The pupa may be exposed or within a cocoon.



STAGES IN THE LIFE OF THE BUTTERFLY

A, egg cluster on leaf (top left: single egg magnified); B, caterpillar; C, chrysalis; D, butterfly, in flight and at rest

Chrysanthemum (Gk *chrysos*, gold; *anthemon*, flower), genus of Compositae, contains about 150 species of varied and beautiful plants which are natives of all countries but Australia, and are generally hardy in Britain. The plants are either herbaceous or shrubby in habit, and the flower-heads consist exclusively of ligulate florets of almost every colour except blue. Pure white, bright yellow, deep and pale red, rich purple, and dark brown occur in different varieties, and contribute to the beauty for which the species are admired. The parents of the autumn-flowering C.s are *C. morifolium* and *C. indicum*, and natives of China and Japan. In cultivation the different varieties require a good, rich, well-manured soil, and they should be carefully protected from frost. In Britain we have sev. common species. *C. segetum*, the corn marigold, is an annual with yellow flowers, and occurs as a weed in fields; *C. leucanthemum*, the ox-eye or dog-daisy, is a well-known meadow plant with white ray florets and yellow disk-florets; *C. frutescens*, the Paris daisy or marguerite of France, is grown as a garden plant and somewhat resembles *C. leucanthemum*; *C. parthenium*, the feverfew, has small flower-heads, and is used as a remedy for slight fevers; *C. carinatum*, the tricolor daisy, comes from Barbary, and is an annual cultivated in Britain; *C. arcticum* is a small species with pink and white florets. In this country hardy perennial C.s include the hardy border as well as the early and late flowering Jap. (greenhouse) kinds, both single and double flowered in white, and practically every colour and shade excepting blue. They flower from Aug. to Christmas (indoors), from Aug. to mid Dec. (hardy border) outdoors. Hardy

annual types (*C. carinatum*) or summer-flowering marguerite, will flower from seed sown in a very sheltered border, or in a cold frame the previous autumn, or in a greenhouse. They have both single and double (*C. coronarium*) flowers in many colours, and white. There is a growing tendency to sustain the stock of perennial C.s from seeds sown in heat in Feb. to flower the following autumn, so as to obviate the trouble of growing on from cuttings year by year in greenhouses.

Chrysanthemum, Order of the (Kikkwa Daijasho), was instituted in 1877 by the Emperor Musto Hiti of Japan, and is conferred on members of the royal house and on foreign princes. The badge is conventional in design, with a red sun in the centre, sending forth white and gold rays, separated into 4 groups by a yellow C. with green leaves, the whole hanging from a larger yellow C.

Chryseis, daughter of the priest of Apollo at Chryse in the Troad. Taken prisoner by Achilles, she was given as part of the spoils to Agamemnon, who thereby called down the wrath of Apollo upon the whole Gk army in the form of a pestilence. When the seer Chaleas revealed the cause of the god's anger, Agamemnon was obliged to restore her; but he took Achilles' slave, Briseis (q.v.), in compensation. Homer's *Iliad* tells the disastrous consequences of the ensuing quarrel.

Chryselephantine (Gk *chrysos*, gold; *elephas*, ivory), adjective used to describe the gold and ivory statues of the Greeks, by far the most famous of which were the colossal Zeus at Olympia and Athena in the Parthenon of Phidias. A development from wooden images where flesh was painted white and drapery gilded, these C. statues were built up on wooden or clay cores, by attaching thin plates of ivory (to represent flesh tints) and gold. The preciousness of the materials amply accounts for the non-survival of any illustration of this art.

Chrysididae, family of insects, in the series Hymenoptera Tubulifera, consists of near allies of the true wasp which are called popularly ruby-wasp or golden-tailed flies. They are brightly coloured creatures with wings moving so swiftly as to make them invisible, and in habit they are parasitic in the nests of bees and wasps. *Chrysis ignita* is a common Brit. species. The adult wasp lays her eggs in the nest of other species, and the larva feeds upon the young insect which it has supplanted. The Chrysis is a brilliantly coloured and very active creature.

Chrysippus (c. 280-207 BC), Gk philosopher, and one of the leaders of the Stoic school, b. at Soli in Cilicia. He came to Athens and studied under Cleanthes. His skill in argument and his impartiality and reasonableness earned him the name of the Column of the Portico (Stoa). C. became head of the Stoic school at Athens in 232 BC, and saved the doctrines of the Stoics from extinction. He is said to have written 750 treatises, of which only fragments survive; some of them are preserved in the MSS. found at Herculaneum. See

N. L. Davidson, *The Stoic Creed*. 1907, and E. Bréhiet, *Chrysippe*, 1910; M. Pohlenz, *Zenon und Chrysippa*, 1938.

Chrysobalanus, family Rosaceae, a genus of tropical shrubs or trees, of which *C. icaco*, the Coco Plum, grows to 6 ft high, with sweet, edible fruits, esteemed in the W. Indies; and *C. oblongifolius*, a small shrub, are both natives of Florida, sometimes grown in warm greenhouses.

Chrysoberyl, crystallised mineral generally of a green colour, translucent, and having a vitreous lustre and conchoidal fracture. Sp. gr., 3.8; hardness, 8.5. It consists of alumina, 77.0 per cent; glucina, 17.5 per cent; protoxide of iron, 5.0 per cent; other matters, 0.5 per cent. A few specimens are met with uncrystallised. It is found mostly in Ceylon and Brazil. When the green is very pale it is often called oriental chrysolite. It crystallises into 6-sided crystals.

Chrysochloridae, family of insectivorous mammals containing a single genus with about half a dozen species known as Cape golden moles and found in central and S. Africa. The Chrysochlore has mole-like habits, and its eyes are covered with skin, but it has only 4 digits on its fore-paws, while the mole has 5. It has no tail, and the ears lack pinnae. *C. capensis*, the Cape Chrysochlore, has a velvety fur of metallic lustre, burrows underground, and feeds on worms and insects.

Chrysocola, ore of copper, being the hydrated silicate of that metal. It is of a bluish colour, and found in large quantities in the Mississippi valley and in smaller quantities in Cornwall and Cumberland.

Chrysocoma, genus of composite plants, is indigenous to S. Africa. *C. comataurea*, evergreen shrub with yellow flower-heads, is grown in garden greenhouses.

Chrysolite (golden stone), mineral of pale greenish colour, crystallising in rectangular prisms. It is a silicate of magnesia and protoxide of iron, the formula being $2(\text{MgFe})\text{O} \cdot \text{SiO}_2$. It is mostly used in jewellery, and is occasionally found in rounded masses, but usually as a constituent of basalts and lavas. The common form of the mineral is olivine, which is of an olive green or brownish colour. The crystals are positively doubly refractive.

Chrysoloras, Manuela (c. 1350-1415), Byzantine diplomat and scholar. He taught Greek at Florence (1397-1400) and is generally considered as the originator of Gk studies in Italy. His prin. work is a Gk grammar, *Graecae Grammaticae institutiones*, 1534.

Chrysomelidae, large family of coleopterous insects, consists of smallish and brilliantly coloured species. The fat little grubs and the perfect beetle are both vegetarian in diet, and many are destructive to crops. The well-known Colorado beetle (q.v.) is a species which feeds on potatoes.

Chrysophyllum Cainito, or Star-apple, is a species of Sapotaceae which grows in the W. Indies; an evergreen tree, growing to 50 ft, with small white flowers in

clusters, followed by apple-like green and yellow fruits, of soft, sweet, and pleasant taste; the black seeds presenting a stellate figure, to suggest the common name.

Chrysoprase, mineral variety of chalcedony (q.v.) used as a precious stone, more particularly on the Continent. Its prin. constituents are crystalline and amorphous silica which are combined to give differential effects; the fine apple-green colour is due to nickel oxide. It is obtained from Silesia, Oregon, and California.

Chrysorrhoeas, see JOANNES DAMASCENUS, St.

Chrysosplenium, genus of Saxifragaceae, occurs in mild countries, its species being herbaceous plants with pale green flowers. *C. alternifolium* and *C. oppositifolium* are natives of Britain, and are called golden saxifrages.

Chrysostom (Gk, 'the golden-mouthed'), St John (c. 345-407), one of the great fathers of the Church, also known as John of Antioch, where he was b. At the school of the sophist Libanius he showed such intellectual gifts that he would have succeeded his teacher as head of the school had not his mother and his many Christian friends persuaded him to be baptised, c. 370. For 10 years he lived in the desert, studying theology, but his austerities damaged his health, and he returned to Antioch, and was ordained. After 10 more years' strenuous work there he became Archbishop of Constantinople, and one of the greatest preachers of the age. His eloquence, however, made him as many enemies as adherents. His sermons in St Sophia were directed against the Arians, but even more against the licentiousness of the imperial court and the idleness and vice of the innumerable monks in the city. The Arians, having no place of worship, met at night outside public buildings, and sang hymns expounding their doctrines. To counteract this C. arranged nightly processional hymn singing, the first example of hymns combined with an act of worship. Riots ensued and much bloodshed, the Empress Eudoxia's chief eunuch being slain. Theophilus, Bishop of Alexandria, summoned C. to a synod which met at Chalcedon through fear of the fury of the people of Constantinople, ardent supporters of their archbishop. He refused to appear, was condemned for Origenism and contumacy, and removed to Nicaea in Bithynia. The populace was so furious that he was hastily brought back to Constantinople, but 2 months later exiled again, this time to Cucusus in Cilicia. There he wrote many of his greatest sermons and letters, and planned missions to the Persians and Goths. His enemies then had him moved to the far desert of Pityus, and on his way there he d. Fresh riots broke out in Constantinople at the news, and peace was not restored until his bones were brought back 30 years later. His festival in the E. Calendar is 13 Nov., in the W., 27 Jan. The prayer of St C., in the Eng. Book of Common Prayer, is from the liturgy (q.v.) named after him. For his works

see *Oxford Library of the Fathers*, and lives by W. R. W. Stephens, 1872, R. W. Bush, 1885, and A. Puech (collection, *Les Saints*), 1891; also E. Leigh-Bennett, *Handbook of the Early Christian Fathers*, 1920, Palladius, *Dialogus de vita S. Chrysostomi* (ed. by P. R. Coleman-Norton), 1928, and *Divine Liturgy* (trans. by E. E. Brightman), 1931.

Chrysostomus, see DION CHRYSOSTOMUS.

Chrysotrux, genus of squirrel monkeys, belongs to the family Cebidae (q.v.). It consists of 4 species, all of which are arboreal, insectivorous, and gregarious; the long tail is non-prehensile and the face is small.

Chrzanów, tn of Poland, in Cracow prov., 25 m. W. by N. of Cracow (q.v.). It is in a coal and lead-mining dist., and has manufs. of rolling-stock and cardboard. Pop. 20,000.

Chu: 1. Riv. some 570 m. in length, in the Kirgiz S.S.R. of Soviet Central Asia. Rising in the Tienshan Mts. in the WSW. of Lake Issyk Kul, it is first known as the Koshkar. Passing within 3 m. of Issyk Kul, it swerves into the gorge of Buam, and leaving Tokmak behind flows on towards Lake Saumukul, disappearing in the desert 125 m. before reaching it. Its valley supports one-third of the total pop. of the rep., and its water has in recent years been used for irrigation works, bringing 200,000 ac. of formerly arid land under cultivation. The valley produces grain and cotton, and is noted for horse-breeding.

2. Tn in Karaganda Oblast of Kazakh S.S.R. Pop. 20,000.

Chu Teh (1886-), Chinese military leader and vice-chairman of the People's Rep. of China, b. Yilung, Szechwan. In 1909 he entered the Yunnan Military Academy in Kunming, and upon graduation in 1911 was appointed a company commander by Gen. Ts'ai Ao, who was a member of Sun Yat-sen's (q.v.) revolutionary party. After defeating the Manchuk Army, and as a result of his success in other engagements, C. T. was rapidly promoted to the rank of brigadier-general. He commanded a regiment in 1915. Having defeated the traitor Yuan Shih-kai's troops in 1916, C. T. was in command of a brigade in 1919. He went to Germany in 1922 for further studies in military science. He joined a branch of the Chinese Communist party there and studied sociology at Göttingen. When he returned to China in 1925 he was given the command of the 20th Army in Szechwan. In 1927 he was director of the Bureau of Public Safety in Nanchang and also commandant of the Nanchang branch of the Whampoa Military Academy. When the Nanchang uprising broke out on 1 Aug. 1927 he joined the mutiny forces and organised the first Chinese Red Army on the borders of Kiangsi and Fukien. In 1928 he joined forces with Mao Tse-tung (see CHINA, History). From 1930 to 1934 Chiang Kai-shek assembled forces sev. times greater than those of the Red Army. As Communist commander-in-chief C. T. showed considerable military genius in

repeatedly beating off and out-manceuvring Chiang's forces, and finally, together with Mao Tse-tung, led the Red Army in its long march (6000 m.) to Yenan, 1934-5. During the Sino-Jap. War the Red Army was reorganised into the 8th Route Army and C. T. was appointed its commander-in-chief. It operated behind the Jap. lines in N. China. By the end of the war the Communists had equipped 60 divs. with captured Jap. and puppet arms. In the ensuing civil war C. T. was commander-in-chief of the People's Liberation Army. In the first session of the National People's Congress in 1954 he was elected vice-chairman of the People's Rep. of China. In 1955 he was honoured as the first marshal of the rep.

Ch'u T'zu, see CHINESE LITERATURE.

Chü Yuan, see CHINESE LITERATURE.

Chüanchow (Chinkiang), anct. port and walled city in the prov. of Fukien, China. There being now a great sand-bar across the harbour mouth, C. has been outstripped in trade by the port Amoy. The most famous bridge in the whole of China connects C. with its suburb, Loyang. Marco Polo and other travellers mention C. as carrying on a large traffic with Europe in the Middle Ages.

Chub, name of sev. carp-like fishes, in the large family Cyprinidae, is applied in Britain to *Leuciscus cephalus*. In N. America, however, it is given to the nearly *Leucosomus corporalis*, and to fishes of the genus *Ceraticthys*.

Chubb, Charles (1773-1846), locksmith, improved the detector lock, which his brother Jeremiah had originally patented in 1818. Originally Jeremiah and Charles C. had an ironmonger's and ship's outfitter's shop in Portsmouth. After the invention of the C. lock they opened a lock factory in Wolverhampton. C. then went to London, where he set up a factory for burglar- and fire-proof safes of his own patent in 1835.

Chubb, Thomas (1679-1746), delst. b. E. Harnham, near Salisbury, the son of a maltster. Apprenticed to a tallow chandler, he educ. himself after his father d. in 1688, theology being his favourite subject. In 1715 he wrote *The Supremacy of the Father Asserted*, followed by other theological works.

C. represents a popular form of deism, and shows the hold that rationalism had then taken on the popular mind. His works also include *A Discourse concerning Reason*, 1731, and *The True Gospel of Jesus Christ*, 1739.

Chubut, ter. in S. Argentina, bounded on the N. by Rio Negro, on the E. by the Atlantic, on the S. by Santa Cruz, and on the W. by Chile. Connected by rail with Puerto Madryn on the Bahía Nueva. Rising in the Andes, the R. C. flows straight across to the Atlantic. The Chico discharges into Lake Colhuapi (or Colhué Huapi), other lakes of size being La Plata and Fontana in the Andean highlands, and Musters and Grande Salada in the interior. Agriculture is carried on by irrigation along the banks of the R. C. Sheep are raised and some cattle. The ter. is colonised mostly by

descendants of Welsh immigrants. Rawson is the cap. and Madryn (44 m. distant) the chief port. Total area 65,669 sq. m.; pop. 58,900.

Chüching, or **Kiutsing**, well-fortified city, 78½ m. ENE. of Kunming, in the prov. of Yunnan, S. China.

Chucuito, prov. of Peru, former cap. of this prov., 12 m. from Puno, on W. of Lake Titicaca; altitude about 11,820 ft. There are silver- and gold-mines, woollen manufs., and dyeing of vicuna wool. Prehistoric remains have been found in the dist. Pop. 3200.

Chudleigh, or **Chidley**, promontory on the N. coast at the entrance of Hudson Straits in Labrador, Canada.

Chudleigh, tn in Devon, England, 10 m. SW. of Exeter. In 1807 it was almost destroyed by fire, but was rebuilt. It is noted for cider. Pop. 2000.

Chudakoye Lake, see **PEIPUS**.

Chufut-Kale ('Jewish Town'), deserted tn 2½ m. E. of Bakhchisaray in the Crimea. Perched on almost inaccessible cliffs, it was, in the 15th cent., the refuge of the Karaite Jews from the Crimea.

Chuhaiung, tn on the Burma Road, 77 m. W. of Kunming, in Yunnan, China.

Chukhi (own name **Lu-oravetan**—'people'), people dwelling in scattered groups in the N. of the Russian Far E. between the Bering Straits and the Kolyma R., numbering (1936) 11,000, and speaking a Paleo-Asiatic language. They combine the physical features of Mongols and Amer. Indians and are divided into the semi-nomadic Reindeer C. in the interior and the sedentary coastal C. engaged in sea-animal hunting and fishing. They have been known since 1644, when Russian Cossacks first reached them. They stubbornly fought for independence from Russia and were not finally subdued until the 1930's.

C. National Dist., formed in 1930, belongs to Magadan Oblast. Area 274,500 sq. m., pop. (1956) 43,000, mainly Russians, also C. and Eskimoos. It has some coal, lead, and zinc mining, mostly by forced labour. See **V. Bogoraz**, *The Chukchee*, New York, 1904-10, and **W. Kolarz**, *The Peoples of the Soviet Far East*, 1954.

Chukiang, see **CANTON RIVER**.

Chul'man, settlement in S. Yakutia (SE. Siberia), on the Amur-Yakutsk highway. It is the prospective centre of the metallurgical industry, based on large iron-ore and coking coal deposits found in the area.

Chulmleigh, mkt tn 2 m. from Eggesford station and 14 m. SE. of Barnstaple in Devon, England. Pop. 1143.

Chumbi Valley, natural approach to Tibet from India, up which the Brit. expedition to Lhasa in 1904 advanced. Flanked by Bhutan and Sikkim, it lies on the S. slopes of the Himalaya at an elevation of 9500 ft.

Chunam, Indian name for quicklime, made from very pure limestone or from calcined shells. It is used as an ingredient for plaster, when it is well mixed into a paste, together with fine riv. sand and jaggery (coarse sugar).

Chungking, commercial cap. of the prov. of Szechwan and of the whole of W. China. As a result of the Jap. invasion of China during the Second World War C. became the Chinese cap. of Chiang Kai-shek's gov. and the centre of Chinese resistance to both the Jap. invasion troops and the Chinese Communists. It occupies the end of a high rocky bluff at the confluence of the R. Kialing with the Yangtze, and is surrounded by a stone wall in good repair. Before the war with Japan it had many fine shops and streets. Its pre-war exports were yellow silk, wax, hides, wool, hemp, feathers, etc., and Chinese medicines, but even before the Jap. invasion trade had been crippled by brigandage in the interior. In the Second World War C. was repeatedly bombed by Jap. aeroplanes, but its natural defences and shelters guaranteed its immunity from destruction. The tide was turned largely by allied air power despite the smallness of the available forces. Heavy bombers struck at the Jap. base of Ichang, disrupting communications (29 May 1943), and next day a Chinese counter-offensive was launched which threw the Jap. force back in disorder; and by June the threat to C. had been removed. With the walled city of Kiangpeh, now incorporated in C., and the large vils. near by, C.'s pop. has grown to 1,360,000. A railway from C. to Chengtu was built in 1951.

Chupanga, or **Shupanga**, vil. of Portuguese E. Africa, on the r. b. of the Lower Zambesi R. The wife of David Livingstone was buried here (1862).

Chuprov, **Aleksandr Ivanovich** (1842-1908), Russian economist and liberal publicist. His research in agric. economics exercised considerable influence on contemporary thought in Russia and provided the basis for the future Neopopulism (q.v.).

Chuquibambata, tn in the prov. of Antofagasta in the N. highlands of Chile. It is one of the world's most important copper-mining and processing centres. Pop. 10,000.

Chuquibambata, or **Charcas**, dept in S. Bolivia lying between the Andes in the W. and bordering on the Chaco, Paraguay, in the E. It has fertile valleys and tropical lowlands. The cap. is Sucre (q.v.). It covers an area of 19,140 sq. m. Pop. 392,800.

Chur (**Fr. Coire**; **Romansh Cuera**), the cap. of the canton of the Grisons, Switzerland, lying in the valley of the Upper Rhine. It still contains many 15th- to 17th-cent. buildings. The cathedral of St Lucius was begun in 1178. The episcopal court occupies the site of the Rom. *castrum*, which commanded the road leading over the passes. The tn is mentioned as a bishopric in 452, and was freed from the bishop's rule in 1464. The townsmen embraced the Reformation in 1524. The painter Angelica Kauffmann (1741-1807) was born here. Although C. is 1950 ft above the sea, the climate is very mild. Pop. (1955) 21,100.

Church, **Alfred John** (1829-1912), classical scholar, educator, and author, master at the Merchant Taylors' School,

1857-70. With Brodrick he trans. Tacitus (3 vols.), 1862-77. He is best known for his attempts to popularise the classics. His *Stories from Homer* and *Stories from Virgil* appeared in 1878. He also wrote *Stories from the Greek Tragedians*, 1879, *Stories from Livy*, 1882, and *Stories from Herodotus*. Other works are *Roman Life in the Days of Cicero*, 1883, *Carthage*, 1886, and *The Crusaders*, 1905. C. ed. *Horae Tennysoniae* (trans. into Lat. verse), 1868.

Church, Sir Arthur Herbert (1834-1915), chemist and scientific writer, prof. of chem. in the Agric. College of Cirencester, 1863; at Royal Academy of Arts, 1879-1911; lecturer at Cooper's Hill, 1888-1900. Among new minerals discovered by C. are churchite (called after him), and the animal pigment turacin. He was president of the Mineralogical Society, 1898-1901. He carried out researches in various branches of chem., and besides scientific memoirs his works include *Precious Stones*, 1883, *English Earthenware*, 1884, *English Porcelain*, 1885, *Food Grains of India*, 1886, *The Chemistry of Paint and Painting*, 1890, *Josiah Wedgwood*, 1894, and *The Conservation of Historic Buildings and Frescoes*, 1907. He was made K.C.V.O. in 1900.

Church, Sir Richard (1784-1873), soldier, one of the liberators of Greece, son of a Quaker, b. Cork. He accompanied the expedition to the Ionian Is. in 1800, raising 2 regiments of Gk light infantry in 1809 and 1812. C. was Eng. representative with the Austrian troops at the time of Napoleon's fall (1813-14), and served King Ferdinand of Naples from 1817 to 1820. On the outbreak of the Gk revolution and war of independence he became general of land forces there (1827), but an attempt to relieve the Acropolis failed, owing to lack of co-operation. He was more successful in W. Greece, forcing the garrisons of Missolonghi and Lepanto to surrender (1828), but resigned his command in 1829. He helped in the revolution of 1843, which gave Greece a constitutional gov. See E. M. Church, *Sir R. Church in Italy and Greece*, 1895.

Church, Richard (1893-), poet and novelist, b. London. Educ. at Dulwich Hamlet School, he entered the Civil Service and remained in it till he was 40. His first book of poems, *Flood of Life*, 1917, was followed by some 10 others, and his *Collected Poems* appeared in 1948. His best-known novel is *The Porch*, which won the Femina Vie-Heureuse prize for 1938; it forms a sequence with *The Stronghold*, 1939, and *The Room Within*, 1940; later novels are *The Sampler*, 1942, *Green Tide*, 1944, and *The Dangerous Years*, 1956. Among his critical works are *Mary Shelley*, 1928, *British Authors*, 1943, and *The Growth of the English Novel*, 1950. In 1955 he pub. his prize-winning autobiography *Over the Bridge* followed by a sequel, *The Golden Sovereign*, 1957, and in 1957 he was made a C.B.E.

Church, Richard William (1815-90), divine, nephew of Sir R. C. (d. 1873), became fellow of Oriel, 1838. C. was an intimate friend of J. H. Newman at this time, and allied to the Tractarian party.

In 1844, as junior proctor, he vetoed a proposal to censure *Tracts for the Times*, No. 90, publicly. He founded the *Guardian*, 1846, and contributed also to the *Saturday Review*. C. became rector of Whitley, 1852, and was nominated by Gladstone to the deanery of St Paul's, 1871. On Archbishop Tait's death, Gladstone wished C. to succeed. As an ardent high churchman he deprecated anti-ritualism, and urged toleration. Among his many works are *Civilisation and Religion*, 1860, univ. sermons in *Human Life and its Conditions*, 1876-8; a series of St Paul's and Oxford sermons in *The Gifts of Civilisation*, 1880, and *Discipline of the Christian Character*, 1885; *Village Sermons preached at Whitley*, 1892-7. C. wrote *Spenser*, 1879, and *Bacon*, 1884, for the Eng. Men of Letters series, both admirable works. Other works are *The Beginning of the Middle Ages*, 1877, and *The Oxford Movement*, 1891. C. ed. Hooker's *Ecclesiastical Polity*, i. 1868, and with Paget revised Kobbie's ed. of Hooker, 1888. See M. C. Church, *Life and Letters of Dean Church*, 1895, and D. C. Lathbury, *Dean Church*, 1907.

Church (from Gk *kuriakon*, 'belonging to the lord'; hence 'the Lord's House'). The term originally was confined chiefly to buildings used for Christian worship; but its use was extended later to: (a) the whole body of Christian believers, e.g. 'The Church Universal'; (b) a large organised national, regional, or theological group of Christians, e.g. 'The Church of England', 'The Methodist Church', 'The Greek Orthodox Church'; (c) a single local community or congregation, e.g. 'The church at Corinth' (1 Cor. 1.2).

Following is a brief description of the development of types of building erected by Christians for various forms of worship and in successive periods of hist. (For the architectural style of their buildings, see ARCHITECTURE, 4-9; also articles on the architecture of separate countries, e.g. FRENCH ARCHITECTURE.)

In the first years of Christianity, when persecution prevailed in the Rom. Empire, the small congregations met secretly in private houses or in the catacombs (q.v.) outside Rome. The earliest surviving C.s were erected in Rome just before or soon after Constantine's Edict of 313, permitting freedom of worship throughout the Empire. (For a list of them, see ITALIAN ARCHITECTURE.) They are now all known as 'basilican churches' or 'Christian basilicas'; because their general form resembles that of the secular basilicas used in Rome, Pompeii, and elsewhere, as covered places of assembly for the transaction of legal and commercial business (see BASILICA).

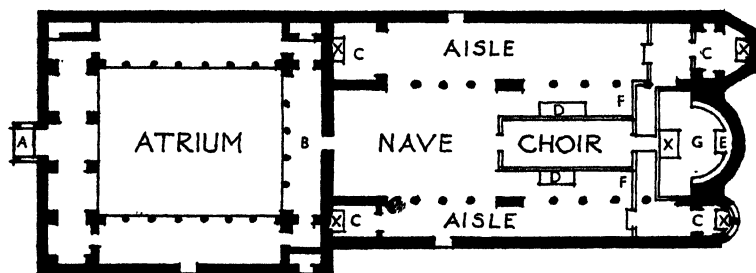
The early basilican C.s usually had an aisled nave, separated from its flanking aisles by a range of columns; round-headed windows in the wall above them (later called the 'clerestory' (q.v.)) to light the nave; an apse at the E. end; and a narthex or vestibule at the W. end. While this type of plan, often with added

transepts forming a 'Latin cross' or cruciform plan, was adopted throughout most of W. Europe during the Romanesque period, the Byzantine or Orthodox Gk C. in E. Europe favoured a 'Greek cross' plan, with a central dome and 4 short arms of equal length, in contrast to the long nave and choir and the short transepts of the Rom. Catholic W. (see ARCHITECTURE, 4).

The cruciform plan was not adopted to symbolise Our Lord's crucifixion, but in order to provide increased space by adding transepts; and the curious deflection sometimes apparent in the axis of the choir, once alleged to symbolise the inclination of Christ's head on the cross, is now believed to have been entirely unintentional, and due to inaccurate setting-out of the foundations.

chancel only, without porches, aisles, or transepts. As local pop. increased, most C.s were enlarged gradually. The usual procedure was to add 1 or 2 aisles, 1 or 2 porches, a W. tower, occasionally 1 or 2 transepts; also to lengthen the chancel—possibly substituting a square E. end for a Norman apse. Chantry-chapels were frequently added at the cost of pious or repentant parishioners; and such chapels often filled up the angle between chancel and transept, so that the whole plan of the C. was changed between Norman and Tudor times.

Fixed fonts of stone or lead were usually installed in medieval C.s; but organs were almost unknown, and were rare even in London in 1700. (On various internal details of medieval C.s, see AISLE; AMBULATORY; APSE; CHANCEL; CHANTRY;



PLAN OF THE BASILICAN CHURCH OF SAN CLEMENTE, ROME

A, Entrance; B, Narthos; CC, Chapels; D, Ambones (= pulpits); E, Bishop's seat; F, Marble screens (*cancelli*); G, Apse; XX, Altars.

The chancel derives its name from Lat. *cancelli*, the barriers provided in secular basilicas to protect the judge in the apse from the public in the nave. In the early Christian basilicas there was a range of seats around the apse for the bishop (in the middle) and officiating clergy, who thus had their backs to the E., and faced the congregation. As the elaboration of services increased, space was needed for a choir as well as for the clergy; and the 'chancel' or 'presbytery' was therefore lengthened, and divided from the congregation by a screen, at first low and often of marble; later, of Gothic traceried woodwork, allowing a view of the altar but maintaining a sharp distinction between the nave and the chancel.

The chancel is often called the 'choir,' although in some C.s (e.g. Westminster Abbey) the choir is seated in the nave; and in some other C.s of later date, in a W. gallery. Eventually, England discarded the Romanesque apse, and most Eng. C.s after c. 1200 have a square E. end. Pulpits and benches were seldom provided before the 17th cent., while closed pews are an innovation of the 17th-18th cents.

Although the largest Eng. C.s were cruciform, few of the smaller ones were. They often consisted of a nave and

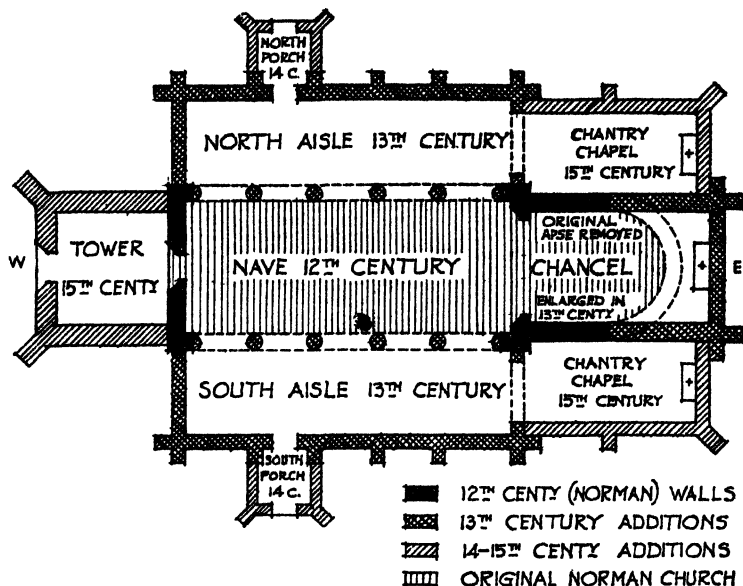
EASTER SEPULCHRE; GALILEE; JESSE WINDOW; LADY CHAPEL; NARTHOS; NAVE; PEW; PISCINA; PRESBYTERY; PULPIT; PULPITUM; REJA; REREDOS; ROOD SCREEN; SACRISTY; SCREEN; SEDILIA; SQUINT; TRANSEPT; TRIBUNE; TRIFORIUM.) Besides the normal types of C. just described, a few circular C.s were erected in W. European countries, including England, mainly by the Knights Templars, and based on the C. of the Holy Sepulchre at Jerusalem. A few 'hall-churches' were also erected by the Friars for preaching purposes: such C.s had no chancel or transepts.

The evolution of C. architecture in England was completely interrupted by the Reformation, which occurred in 1531 when Henry VIII proclaimed himself head of the C. of England, which thenceforth was divorced from Rome. For the next cent. and a quarter, very little C. building took place, and much damage was done to the interior of C.s. Thomas Cromwell, on behalf of the newly reformed C. of England, led the official 'Protestant' campaign to remove from all C.s, and destroy, objects which in the opinion of the eccles. authorities were 'idolatrous.' The list included representations of God, Christ, the Virgin Mary, the saints, and the cross—even

religious texts and inscriptions; whether painted on glass or plaster, carved in stone or wood, or engraved on metal. This 'iconoclasm' continued through the reigns of Edward VI and Elizabeth; but under Mary there was a brief Catholic reaction during which carvers worked overtime to reinstate the destroyed 'images,' many of which were very beautiful. Archbishop Laud (q.v.), in the next cent., took various steps to restore order and seamliness in the C.s; but his bigotry in other directions led

was imitated by other architects throughout the 18th and early 19th cents., though from c. 1720 to c. 1820 comparatively few C.s were built.

Before the Toleration Act of 1689, hardly any Nonconformist 'meeting-houses' had been erected, but during the next 11 years over 2400 buildings were registered for worship by Congregationalists, Baptists, and Presbyterians, who had become very numerous since their beginnings under Elizabeth I. Most of these buildings, of which a few



PLAN SHOWING THE GROWTH OF A TYPICAL ENGLISH PARISH CHURCH

to the final wave of iconoclasm (q.v.) in the Commonwealth. Oliver Cromwell's personal share in this is uncertain, and has been exaggerated.

When C. building on a large scale was resumed by Wren (q.v.) after the Great Fire of London in 1666, he introduced entirely fresh ideas into religious architecture, abandoning the 'Roman' type of ritual arrangement together with the Gothic style which had been used up to the Reformation. He accepted the Protestant outlook, and frankly planned his new London C.s as preaching-houses, though enriching them with brilliant design and excellent craftsmanship. In many of those on cramped sites, he was constrained to install galleries (much as he disliked them) in order to bring the congregation within range of the preacher's voice. The type of C. designed by Wren between 1666 and c. 1710

remain, were in Wren's style, but simpler owing to lack of funds (see NONCONFORMIST CHURCH ARCHITECTURE). No new Rom. Catholic C.s were permitted until the Catholic Emancipation Act of 1829.

There was a great boom in C. building in 1818, when Parliament voted a million pounds for new Anglican C.s, most of which were in the newly revived Gothic style (see ARCHITECTURE, 8). For another cent., Gothic held the field for C.s of all denominations, but since 1920 or so more original ideas of design have appeared, in England as elsewhere.

Bibliography (for C.-planning in general: see also bibliographies under ARCHITECTURE, and under articles on the architecture of separate countries). A. H. Thompson, *The Ground Plan of the English Parish Church*, and *The Historical Growth of the English Parish Church*, 1911; A. L. Drummond, *The Church*

Architecture of Protestantism, 1934; G. W. O. Addleshaw and F. Etchells, *The Architectural Setting of Anglican Worship*, 1936; E. H. Short, *A History of Religious Architecture*, 1936, and *Post-War Church Building*, 1947; M. S. Briggs, *Goths and Vandals*, 1952; Incorporated Church Building Society, *Fifty Modern Churches*, 1947; E. D. Mills, *The Modern Church*, 1958.

For C. in the abstract, see the articles listed under CHRISTIANITY.

Church, States of the, or the Papal States (in It., *Stati Pontifici*, *Stati della Chiesa*, etc.), were those portions of Italy formerly under the dominion of the Pope. The temporal rule of the papacy, which dated from the bestowal of the exarchate of Ravenna upon Pope Stephen II by King P  pin, and reached its height under Innocent III (1198-1216), was finally suppressed in 1870. The total area of the states in 1859, the last year of their entirety, was 16,000 sq. m., the pop. 6 years earlier being over 3,000,000. Legations were ruled by cardinals, delegations by prelates. With 2 small exceptions, the papal states may be said to have formed a compact prov. bounded on the NE. by the Adriatic, on the SE. by the kingdom of Naples, on the SW. by the Mediterranean, on the W. by Tuscany and Modena, and on the NW. by the Lombardo-Venetian kingdom. In 1929 a Concordat between the It. Gov. and the papacy granted the Pope independence and the control of a small area known as the Vatican State.

Church-ale, kind of ann. church festival in medieval England at which quantities of ale were drunk. (For the compound, cf. bridal, scot-ale.) It was held in the churchyard or near the church, usually at Whitsuntide or Easter. The profits were often used for church funds or charitable purposes. Music, bull-baiting, dice, and dancing formed the amusements. The practice died out after the Reformation, and was always strongly denounced by the Puritans. The nearest modern equivalents are village fairs or wakes. See Philip Stubbs, *Anatomie of Abuses*, 1583.

Church Army, mission of the Church of England estab. in 1882 by the late Prebendary Wilson Carllie, C.H., D.D., as a working people's mission to working people. It has maintained this characteristic throughout many changes and developments. The evangelistic work includes a training college for evangelists and mission sisters, and for representatives of various pars. during special Evangelistic Week-ends; parochial evangelists and mission sisters working as lay helpers of the clergy; mission vans visiting remote country pars.; missions at the seaside, in prisons, public assistance institutions, and slums. The social work includes lodging and residential hostels throughout London and the provs. for the reception of tramps and working men; lodging hostels, moral welfare work, homes, etc., for women, girls, and children. In various parts of the country there are also homes for elderly men and women. There are also youth centres and clubs.

In addition to carrying on and developing its normal work the C. A., working on behalf of men and women on foreign military service, has provided rest and recreation centres, hostels, etc. C. A. Housing Ltd has built upwards of 1000 houses and flats which are let to poor, large families. 'Churchill' houses are being purchased and adapted to let at low rentals to elderly people who need security with independence. Everything is done under episcopal authority and in co-operation with the parochial clergy and responsible chaplains. The C. A. work is also carried on in many other parts of the world and new fields have been opened up in Kenya and the West Indies. H.Q.: 55 Bryanston St, London, W.1.

Church Assembly, The, short title of the National Assembly of the Church of England, set up in 1920. During the 19th cent. when Parl. business greatly increased, a need was felt for machinery by which legislation affecting the Church could be dealt with so as to make less demand on time in Parliament. At the same time it was thought that the laity ought to have a voice in the councils of the Church. Proposals to this end by an Archbishops' Commission on Church and State, 1916, led to the passing of the Enabling Act, 1919, conferring powers on a National Assembly. The Assembly consists of a House of Bishops (the 43 diocesan bishops), a House of Clergy (identical with the Lower Houses of the Convocations (q.v.) of Canterbury and York sitting together), and a House of Laity, numbering about 350, elected by the lay members of the Diocesan Conferences. It meets 3 times a year for periods of 5 days at Church House, Westminster. Its meetings are public.

The C. A. is 'free to discuss any proposal concerning the Church of England and to make provision in respect thereof.' In any matter which requires legislation the Assembly proceeds by 'measures.' When approved by the 3 Houses, measures are submitted to the Eccles. Committee of Parliament which then reports to Parliament on the legal aspects of the proposals. A measure then, unless withdrawn at this stage, is laid before Parliament, and a vote is taken in both Houses as to whether it shall be presented to the Crown. A measure has the force of law on receiving the royal assent. The C. A. may also make resolutions on any matter of religious or public interest, but it may not make any statement purporting to define the doctrine of the Church of England. The long-standing powers of the Convocation are safeguarded, and it is laid down that the Assembly may not 'exercise any power or perform any function distinctively belonging to the bishops.'

The Church of England has thus been enabled to secure many long desired measures of reform. New bishoprics have been created, a clergy pensions scheme inaugurated, statutes of cathedrals revised, the laws of patronage reformed, disciplinary measures passed, and the parochial system reorganised.

The abortive attempt to revise the Prayer Book is described under PRAYER, BOOK OF COMMON (q.v.). The C. A. has set up a number of councils to administer various branches of the work of the Church. These councils co-ordinate the work of many voluntary bodies in their respective spheres. Among them are councils for Women's Church Work, the Care of Churches (i.e. fabric), Education, Moral Welfare, the Overseas Council, and the Social and Industrial Council. The Central Board of Finance is the Assembly's Treasury dept, and the Church Information Board its organ for press relations and publicity. The chairman of the Assembly is the Archbishop of Canterbury, the Archbishop of York being vice-chairman. The treasurer is the Rt Hon. Earl Grey, and the secretary Mr John A. Guillum Scott. The offices are at Church House, Dean's Yard, Westminster, S.W.1.

Church Association, see CHURCH SOCIETY.

Church Brief, see BRIEF.

Church Commissioners, set up by the C. C. Measure, 1947, to unite Queen Anne's Bounty (q.v.) and the Eccles. Commissioners, and to exercise the functions of both bodies. Eccles. Commissioners were founded by Act of Parliament in 1836 following reports of 2 Royal Commissions recommending reforms for radical improvements in the Church's temporal affairs. By an Act of 1840 they were given power to suppress redundant offices and to create from the endowments a common fund for the benefit of parochial clergy. To-day the C. C. include the archbishops and diocesan bishops, 3 Church Estates Commissioners, representatives of deans, other clergy and laity appointed by the Church Assembly, nominees of the Sovereign and the Archbishop of Canterbury, certain officers of State, and representatives of the cities of London and York and the univs. of Oxford and Cambridge. The commissioners deal with payment of permanent income and pensions to bishops and clergy of the Church of England, and central administration for pastoral reorganisation and for provision, maintenance, or sale of parsonage houses and sales and leases of glebe land. They make grants to augment the incomes of the clergy, also for parsonage houses, endowment of new parishes, and church buildings in new housing areas. Their revenues are derived from agric. and urb. estates, largely the anc't estates of bishoprics, chapters, etc., and from securities. The gross income of the general fund in 1954-1955 was £10,529,490, of which 80 per cent was applied towards the stipends of the bishops and some 12,000 of the clergy. The C. C. have done much, assisted by diocesan boards of finance and certain voluntary societies to provide the worst paid clergy with better incomes. Very few benefices are now worth less than £550 per annum, whereas early in the cent. there were hundreds worth less than £250. The offices of the C. C. are at 1

Millbank, Westminster, SW1. A report is pub. annually.

Church Congress. A gathering of both ministers and laymen of the Church of England was annually convened for free discussion of questions concerning Church and State from 1861 onwards. Since 1919 the meetings of the Church Assembly (q.v.) have performed the same function, and C. Cs are no longer held.

Church Councils, see COUNCILS, CHURCH. Church Enabling Act, short title of an Act passed in 1919 setting up the Church Assembly (q.v.).

Church History falls into 3 periods: anc't, medieval, and modern: (1) The first period begins with the descent of the Holy Ghost upon the Apostles (Acts II. 1-11), who then went forth to preach the gospel. They immediately began to baptise converts in large numbers, at first only Jews or proselytes, then Samaritans; but Gentiles also were included after St Peter (q.v.) had received Cornelius and his household into the Church (Acts x). St Paul (q.v.) was the prin. evangelist of the pagan world in the course of his missionary journeys (c. AD 48-58). The question at once arose whether Christians had first to become Jews by circumcision before baptism (q.v.), and observe the law of Moses as well as that of Christ. St Paul strenuously opposed this, maintaining (cf. Galatians) that we are saved by faith in Christ, not by the works of the Mosaic law; and so it was decided by the Apostolic Council at Jerusalem in 50 (Acts xv). Jewish hatred and intrigue helped to turn the Rom gov. against the new faith as a *religio illicita* (an unlawful superstition). Persecution was severe under Nero (64), Domitian (85-96), and Trajan (98-117), whose correspondence with Pliny on the subject is famous. Before Decius (249-51), however, it was only spasmodic and ineffectual, while under Hadrian (117-38) and Antoninus Pius (138-161) the church was regarded as negligible and enjoyed a measure of toleration, being allowed to form funerary associations and poor men's guilds. But from 250 the Church with its hierarchical constitution and systematised worship, was considered a grave menace to the military and religious policy of the empire. Widespread massacres began, and continued until the abdication of Diocletian (305) after desperate but futile efforts to exterminate the whole Christian society. The accession of Constantine (q.v.) in 313 brought peace, for he extended to Christianity all the rights and privileges hitherto enjoyed by paganism alone. But it was not until the reign of Theodosius the Great (379-395) that Christianity was finally made the one and only religion of the state.

During these cents. the Church was growing not only externally by conversions, but also internally by a clearer definition of its faith, and by the development of its liturgy, discipline, and constitution. The first of these chapters, the growth of the Creeds (q.v.), is largely the story of the struggle with heresy, and of the oecumenical councils.

Meanwhile, since the early years of the 3rd cent., the conversion of the heathens in the E.—Arabia, Persia, Armenia—and on the N. and W. confines of Rom. territory had been making continual headway; so that before the great migrations of the 4th cent. the Goths and other Teutonic peoples were already Christians. In Persia and elsewhere, political persecution, and later the force of Islam, wiped out all traces of Christian proselytes. But in the W. the effect of the barbarian invasions was to endow the bishops with much of that social and moral power formerly wielded by Rom. officials; so that the Church came to be regarded as heir to the majesty and influence of auct. Rome.

To Britain Rom. soldiers brought the Christian faith perhaps as early as the 1st cent. There is no historical value in the legends of Glastonbury (q.v.). St Alban (q.v.) is traditionally Britain's first martyr; and 3 bishops (London, York, and probably Lincoln) attended the Council of Arles in 314. But the Romano-Celtic Church was overwhelmed in England by the A.-S. invasions, though it survived in the W., and especially in Wales (see CENYDD; DAVID; DYFRIG; ILLTYD; SAMSON; TEILO). St Patrick (q.v.), himself of Celtic origin, estab. the Church in Ireland about the mid 5th cent. In 596 St Gregory the Great (q.v.) estab. Christianity in S. England through a mission led by the Benedictine St Augustine, who became first Archbishop of Canterbury. But before this, St Columba (q.v.) and other missionaries from the Celtic Church in Ireland had settled in Iona, off the W. coast of Scotland (563) and begun the evangelisation of the N. (see AIDAN, ST). The 2 missions, from Ireland and Rome, had different characteristics. The Romans estab. a highly developed diocesan organisation under the bishop; the Celtic had no such organisation, the abbot being the centre of authority; it grew by the estab. of branch houses, as Lindisfarne sprang from Iona, bishops merely performing the functions of confirmation and ordination.

But the Church in Britain was now delivered from isolation and brought within the influence of the papacy which was to be the main civilising power in Europe for cents. to come. The next 250 years saw vigorous growth. The nation was still divided into separate kingdoms, but the Church was one and played a major part in its unification. She produced scholars of European reputation in Bede (673-735), Alcuin (c. 735-86), and Alfred the Great (848-99). Her vitality expressed itself also in missionary activity in N. Europe, pre-eminently by St Boniface (q.v.) of Crediton (c. 675-754), the apostle of Germany.

(2) There were in the 8th cent. 2 great forces which seemed likely to swamp Christendom, Mohammedanism and the idolatry of the Saxons and other barbaric hordes. But the Gallic conqueror, Charles Martel, by his victory at Tours in 732, effectually checked the Saracens in the W., whilst a 32 years' war (772-804)

at last enabled Charlemagne to subdue the Saxons, their conversion to Christianity being achieved by the building of towns and castles and the foundation of missions and monasteries. With Christianity once firmly estab., the medieval hist. of the Catholic Church becomes the story of the rapid consolidation of the papal power and its lengthy struggle with the Holy Rom. Empire, and into an account of the movements of reform which arose in the church itself, and also of various strivings after other forms of religion and worship which later began to stir in the W. world.

From 730 eccles. lawyers believed and spread the fable of the Donation of Constantine (q.v.), but what contributed far more to the confirmation of the Pope's authority was the severance in 1054 of the W. from the E. church. The Monophysite (484-519) and other schisms had much to do with this rupture, but its real cause was the refusal of the bishops of Constantinople to submit in any way to the Rom. See (see CERULARIUS; EASTERN ORTHODOX CHURCH; FILIOQUE; PHOTIUS). The great monastic orders, Benedictines, Dominicans, and Franciscans, kept burning during the Middle Ages the lamp of auct. science and culture. From the 4th cent. onward, monasticism had continually gained new ground. The conventual life, indeed, was in part a revolt against contemporary society, with its wars and lusts and manifold corruptions, and it was ever a bulwark of the church. Thus from the monastery of Cluny (q.v.), founded in 910, there came what were known as the Cluniac reforms, the reorganisation and cleansing of eccles. offices, and above all the emancipation of the church from state control. Yet, in spite of new orders, reformed clergy, and the work of men like Gerbert, Lanfranc, and Anselm, the marriage of clergy, and evils like simony, and the selling of benefices continued. But for a time the papacy triumphed. From 1048 to 1266 Europe was divided in the famous struggle between Pope and emperor. In 1073 St Gregory VII (Hildebrand) secured at Canossa the complete humiliation of Henry IV, but lay investiture, which formed the substance of the quarrel between St Thomas Becket and Henry II, was not finally settled by compromise until 1122. In England, the Norman conquest had greatly increased the church's influence; but William I had carefully limited the Pope's authority to issue bulls, promulgate canons, and censure his barons, without royal permission. The next cents. saw the tension increased by the quarrels between Henry I and St Anselm, and Henry II and Becket, the long dispute about the appointment of papal legates who tended to undermine the Eng. archbishop's authority, the quarrel between King John and Innocent III, and the anti-papal legislation of Edward I.

Meanwhile in Europe generally, during the pontificate of Innocent III (1198-1216) the papal power attained the summit of its glory, and up to the death

of Boniface VIII (1303) its supremacy was almost unquestioned, for the 4 crusades (1095-1202) (q.v.) had greatly enhanced its reputation.

In the light of modern hist., the struggle between Pope and emperor seems a fatal disaster; for the former, by stirring up the it. cities against the latter, postponed for cents. the consolidation of the Ger. states into a united kingdom. The prevalence of pious frauds; the growth of corruption within the Church; the so-called Babylonian captivity, when the popes resided at Avignon (1305-77); and above all, the schism (1378-1409), when there were rival popes at Rome and Avignon, disabused men's minds of the conception of a World Church and a world empire mutually dependent and working in harmony. In England the papal residence at Avignon during the Hundred Years War, and the intrusion of foreigners, especially Frenchmen, into Eng. benefices, caused resentment. Thinkers everywhere revolted against the conclusions of scholasticism as also against the persecution of the Waldenses and Albigenses (1207 and 1229), and later, of the Hussites and Lollards. The lowered esteem for the schools of philosophy, the laxity among the clergy, and the growth of nationalism, combined with the changed attitude towards the papacy to prepare the way for a new age. With the Renaissance came also the Reformation to open up a new era in C. H.

(3) With the coming of the Reformation, W. Christendom lost its unity. As the direct outcome of the preaching of Luther, Zwingli, Melancthon, and Calvin (q.v.), Protestantism was estab. in opposition to the older Christian Church. For a detailed account of this struggle, see REFORMATION. Lutheranism, which flourished in Scandinavia and Germany, was too conservative of monarchical principles and Rom. ceremonies to retain a lasting hold in other European countries. Here, and especially in S. Germany, Switzerland, Scotland, and the Netherlands, the Calvinistic or Reformed Churches sprang up; their congregations were organised on a thoroughly democratic footing which commended itself to men of radical leanings, while the rigidity of its intellectual doctrine appealed to men of sterner mould and in general to the colder character of the N. In Germany it was only after the peace of Westphalia (1648) that Protestants other than Lutherans won freedom of worship.

The reaction against Protestantism, or the Counter-Reformation (q.v.), as it is called, was led everywhere by the Society of Jesus. Beginning in Bavaria (1563), it swept through S. Germany, and appeared in France during the 16th cent., and did not finally lose its impetus till after 1650. The study of C. H. up to this point developed in the following way. Our earliest documents consist of the N.T., and scraps of information in the writings of the early fathers. In the 2nd cent., Hegesippus, a Jewish Christian who wrote of the early church, was the author of a treatise in 5 books, but only a few

fragments remain. Eusebius of Caesarea, who wrote early in the 4th cent., is known as the father of C. H. He gave an account of the church of the first 4 cents., and his work was continued in the next cent. by Socrates, Sozomen, and Theodoret. All these wrote in the E., whence no important church historian by Nicephorus Callistus (14th cent.) has arisen since. Rufinus trans. Eusebius into Latin, and fresh sequels were added by Theodorus Lector, Evagrius, Theophanes, etc. A trans. of Socrates, Sozomen, and Theodoret was made by Cassiodorus in the 6th cent., and this *Historia Ecclesiastica Tripartita*, formed the medieval text-book on the subject. Other church historians, in early times, were Sulpicius Severus, Jerome, Idatius, Prosper, Victor Tununensis, Isidore of Seville, Gregory of Tours, Bede, and Paulus the Deacon, and in the later Middle Ages, Haymo of Halberstadt, Anastasius, Ordericus Vitalis, and Otto of Freising. The greatest, however, was the Dominican, Antoninus of Florence (archbishop, 1446-59), whose work is often modern in outlook. After the Reformation C. H. was at first largely polemical. The *Magdeburg Centuries*, a Lutheran attempt to show the primitive nature of Protestantism, called forth the *Annales Ecclesiastici* of the Rom. Catholic Baronius, followed by Alexander Natalis (Noel), Bossuet, Tillemont, etc. The scientific and critical era of C. H. began with the German Moshelm, who was followed by a host of others, Catholic and Protestant. From the Reformation onwards the hist. of the church cannot be set forth in a connected narrative. Thenceforward we must speak of the various Christian bodies by the names that distinguish them. See ADVENTISTS; ANGLICANISM; ARMENIAN CHURCH; BAPTISTS; CALVINISM; CATHOLICS, OLD; CHURCHES IN THE UNITED STATES OF AMERICA; COPTS; COUNTER REFORMATION; EASTERN ORTHODOX CHURCH; ECUMENICAL MOVEMENT; ENGLAND, CHURCH OF; FRIENDS, SOCIETY OF (Quakers); HUGUENOTS; JACOBITES; LUTHER (Lutheranism); MARONITES; MELCHITES; MENNONITES; METHODISM; MISSIONS; MORAVIANS; NESTORIANS; NON-CONFORMITY; NON-JURORS; PRESBYTERIANS; REFORMATION; ROMAN CATHOLIC CHURCH; SALVATION ARMY; SCOTLAND, CHURCH OF; UNION OF THE CHURCHES; WALDENSES; WORLD COUNCIL OF CHURCHES. See also the cross-references under CHRISTIANITY.

See P. Battifol, *Études d'Histoire et de Théologie Positive*, 1902; S. Cheetham, *A History of the Christian Church since the Reformation*, 1907; L. Duchesne, *Early History of the Church*, trans. (3 vols.), 1909; A. L. Smith, *Church and State in the Middle Ages*, 1913; F. Funk, *Manual of Church History*, 1914; A. R. Whitham, *The History of the Christian Church to the Separation of East and West*, 1920; B. J. Kidd, *History of the Church to 461*, 1922; M. Deansley, *A History of the Medieval Church*, 1925; J. Tixeront, *Histoire des Dogmas* (3 vols.), 1928; C. P. S. Clarke, *A Short History of the Christian Church*, 1929; P. Hughes, *History of the Church*

(3 vols), 1948 ff.; J. W. C. Wand, *History of the Early Church to A.D. 500* (3rd ed.), 1949, and *History of the Modern Church* (6th ed.), 1949; The Venerable Bede, *History of the English Church and People*, trans. L. Sherley-Price, 1955; H. Daniel-Rops, *Cathedral and Crusade*, 1957.

Church Lads' Brigade, founded in 1891 to make lads faithful members of the Church of England or other Episcopal Church in communion with it. The C. L. B. works in many parishes under the incumbent and lay leaders, using uniform and drill to instil discipline. The movement has spread through the Commonwealth and has provided many clergy from its ranks, two of whom hold the V.C. Camps are held, badges are awarded for many worth-while activities, and training is given in good citizenship. The H.Q. are at 58 Gloucester Place, London, W.1.

Church Missionary Society. This society, founded in 1799, was a direct result of the Evangelical Revival of the 18th cent. The Church of England as a whole was suspicious of the evangelicals and 'their busy zeal about salvation, the slave trade, and a thousand other matters best left alone' (Trevelyan). The 20 or so founders of the C. M. S. had therefore no support from eccles. authority, in spite of the close association with the affairs of the new society of such men as Wm Wilberforce and Charles Grant. Africa and the E. was the C. M. S. objective at a time when Africa was nothing but a few names on the edge of the map and Asia was almost entirely closed to any missionary enterprise. W. Africa was the first sphere of work overseas. There are now over 1000 C. M. S. missionaries, including some 70 former missionaries of the Church of England Zenana Missionary Society (amalgamated with the C. M. S. in 1957). They work in E. and W. Africa, in the Middle E., India, Pakistan, Hong Kong, Japan, and Malaya. They include clergy, doctors, nurses, physiotherapists, and other specialised medical workers, men and women in various branches of education, agriculturists, and a number engaged primarily in evangelistic and social service. With them are associated over 900 clergy and more than 30,000 lay workers who are nationals of Africa and Asia. To-day, in most parts, the leadership of the Church is largely in the hands of the nationals of the country. These have been appointed principals as well as members of staff of many Christian institutions. The training of teachers is, however, still a key task for missionaries of the society, as are new experiments in methods of Christian education. C. M. S. missionaries also continue to pioneer in medical and social services. A further commitment is in the care of students from overseas who, having been educ. in its schools, come to England for further study. The society's vice-patron is the Archbishop of Canterbury. Its president is a layman and it is governed by a democratic, representative committee system. It has given whole-hearted support to the Church of S. India and plays a full part in the movement towards the reunion

of the churches (see UNION OF THE CHURCHES). Many C. M. S. missionaries are now at work in union institutions in which sev. denominations or societies co-operate, notably in the training of ministers, teachers, and doctors. At home the society seeks through a variety of means in meetings, through literature, films, exhibits, and other visual aids to make known the needs and opportunities overseas. Its monthly magazine is *Outlook*. H.Q.: 6 Salisbury Square, London, E.C.4. See also MISSIONS, Protestant.

Church of England, see ENGLAND, CHURCH OF; see also ANGLICANISM.

Church Rates, tax formerly levied in England and Ireland on all occupiers of land within the par. to pay for celebration of divine service and the preservation and repair of the church fabric. The tax was assessed by the par. vestry on the property of each tenant. Since the Compulsory Church Rates Abolition Act of 1868, maintenance of the churches has depended entirely on voluntary contributions.

Church Society, originally known as the Church Association, founded 1865, with the object of 'maintaining the principles and doctrines estab. at the Eng. Reformation and of preserving the purity of Protestant worship in the Church of England. . . . A strong Low Church body, it has formed a Protestant electoral association in many of the parl. bors. and divs. of England. It publishes through the Church Book Room Press Ltd. Address: Dean Wace House, 7 Wine Office Court, London, E.C.4. See *Official Year Book of the Church of England*.

Church Stretton, mkt tn and health resort of Shropshire, England, 13 m. from Shrewsbury and 162 m. from London. It is picturesquely situated on the slopes of Longmynd, at an altitude of 700 ft. Pop. 2600 (1953).

'**Church Times**,' founded in 1863 by G. J. Palmer and still remaining in the Palmer family. Miss Rosamund Essex is editor. It is a general and eccles. newspaper, following the High Church tradition of the Church of England. It carries home and overseas Church news, reviews, political comments, and special articles.

Church Union, originally known as the English Church Union, formed in 1859 as a consequence of the Protestant riots at St George's-in-the-E., its purpose being to maintain unimpaired the doctrine and discipline of the Church of England against Erastianism, Rationalism, and Puritanism, and, further, to repel any attempts to seize the Church endowments for secular purposes and resist all attacks on the Church's marriage laws. The organ of the C. U. is the *Church Observer*. Its offices are at Lord Halifax House, 6 Hyde Park Gate, London, S.W.7.

Churches in the United States of America, The. The early hist. of the C. in the U.S.A. is bound up with the struggle between the Puritans and the clergy sent out from England. But see also ROMAN CATHOLIC CHURCH, *In the New World*.

The greatest achievement of the Puritans was the settlement of New England.

After the arrival of the *Mayflower* there was a bitter conflict between the Separatists and those who still regarded the Church in England as their authority in matters of religion. The non-Separatists included men like John Harvard, founder of Harvard College, but the majority of Puritans in America wished to separate on principle not only from corruptions in the Church but from a Church which tolerated corruptions. Independent or Congregational principles prevailed among them, each congregation being an independent brotherhood bound together by a mutual covenant. The Church or congregation was the source of whatever authority there was, and the community was theocratic. Discipline was rigorous, no distinction being made between sin and crime, and maypole revels and keeping Christmas were penal offences. Throughout the 17th cent. the Puritans were in the ascendancy, gave no toleration towards those who disagreed with them, and were jealous of their hard-won privileges. Early there were conflicts of opinion with the Anabaptists, who, however, differed little from the Congregationalists except over infant baptism. The first Baptist Church in America was founded at Providence by Roger Williams, an extreme Separatist who, as an advocate of toleration, wrote a tract, *The Bloody Tenent of Persecution*, which was answered by Prynne. In his enthusiasm for toleration Williams founded the colony of Rhode Is. (1644) to further it. At least twice Charles II intervened in favour of toleration for Separatists in America, once for the Anabaptists and again for the Quakers, who were accused of defying all civil authority. A royal letter of 1661 requesting that corporal punishment of Quakers should cease gave them relief, but their zeal was so provocative that the respite proved temporary. This was not true of Pennsylvania, where, through the initiative of Wm Penn, there was freedom of conscience. Apart from the Jesuits, the Moravians were the only influential missionary agency up to 1800, though the Society for the Propagation of the Gospel (S.P.G.) had over 50 missionaries distributed over New England, New York, New Jersey, Pennsylvania, Carolina, and Georgia, who ministered not only to the colonists but also to the Negroes and Indians.

The most important religious event in the 18th cent. was the Great Awakening (1735-60). This was a Pietistic movement which preceded the arrival of the Wesleys, led by the famous preacher Jonathan Edwards, whose book, *A Faithful Narrative of the Surprising Work of God*, so strangely influenced John Wesley himself. Methodism proper did not begin in America until 30 years later, the first Methodist bishop being Francis Asbury, whom Wesley sent out in 1771. It spread quickly and is said to be to-day the most powerful religious body in the U.S.A. The most remarkable influence in the Great Awakening was the emotional preaching of George Whitefield, and it is frequently said that no one ever preached

to such vast crowds or received such popular adulation as Whitefield did in America. Wesley's first visit to Georgia, in 1735-7, had been a failure because of his insistence on baptism by immersion, his refusal of sponsors who were not communicants, his rejection of dissenters except on re-baptism, and the personal nature of his sermons, all of which things alienated the settlers and eventually brought him into conflict with the Moravian brethren. However, during the War of Independence Rationalism spread from Europe to America. Tom Paine's *Age of Reason* had great influence in the U.S.A. Its Voltairian cynicism in expounding the common Deist objections to the Bible was calculated to appeal to the more uneducated type of colonist grown discontented under the anarchy of *laissez-faire*, and sympathetic towards Fr. opinions because of the interest shown by France; Paine was popular too as having fought for the colonists in the War of Independence. The way had also been prepared to some extent by the Universalists, whose movement had begun a decade before, but was first organised on a definite basis some 30 years later, when the parent body was estab. in Massachusetts. Universalism as expounded by Hosea Ballou, an excommunicated Baptist, assumed the final salvation of men and denied the Trinity.

There is no estab. Church in the U.S.A. The constitution expressly provides 'that Congress shall make no law respecting an estab. of religion or prohibiting the free exercise thereof.' Nevertheless there is a considerable province of the Anglican Church (see ANGLICANISM) in America, called the Protestant Episcopal Church. Anglicanism, however, had a hard struggle in New England, where in the 17th cent. the colonists were intolerant of it; and it was many years before the episcopal clergy from England obtained a permanent footing there. The Episcopal Church was, however, early endowed in Virginia, and also in Maryland. Early in the 18th cent. the S.P.G. kept episcopacy alive in America through their missions to the Indians in New York, and for most of the cent. supported over 300 missionary priests in the country, of whom, as we have seen above, Wesley was one. During the War of Independence episcopacy, which except in Connecticut had close ties with England, was openly attacked for that reason; and in the S. the existence of the Episcopal Church ceased. L. W. Bacon considers that the real revival of Anglicanism in America dates from the consecration of Bishops Griswold and Hobart in 1811. Bacon remarks that 'no fact in the external hist. of the Amer. Church at this period is more imposing than the growth of the Episcopal Church from nothing to a really commanding station.' See also CLERGY and CLERGY DISCIPLINE ACT. See J. Edwards, *Works* (8 vols.), 1806-11; A. Andrews, *Genealogy and Ecclesiastical History* (of First Church, New Britain, Connecticut), 1867; L. W. Bacon, *The History of American Christianity*, 1897; Platner and others,

The Religious History of New England, 1917; H. K. Rowe, A History of Religion in the United States, 1924; J. T. Addison, The Episcopal Church in the United States, 1789-1931, 1951.

Churchill, Charles (1731-64), clergyman and satirical poet, *b.* Westminster, the son of the rector of Rainham, Essex. His marriage at the age of 17 prevented his going to a univ., but he was prepared for the Church, and took orders in 1753. He became curate to his father in 1756, and when his father *d.*, 2 years later, he succeeded him as curate and lecturer at St John's, Westminster. The Church, however, was not his vocation, and in 1763 he resigned his offices, probably under compulsion, for his disorderly conduct made it impossible to allow him to continue in them. Somewhat earlier he had leaped to literature to supplement his meagre stipend, and in 1761 he pub. at his own expense, having failed to obtain a fair price for it from the booksellers, his theatrical satire, *The Rosciad*. This was at once successful, owing not only to its undoubted merits, but also to its numerous personalities. This was followed by other works, the best known of which is the *Apology*, all of them being distinguished by their robust satire and vigorous versification. C. now became acquainted with Wilkes, and wrote many papers for the *North Briton*, 1762-3. When Wilkes was arrested, after the issue of the notorious 'No. 45,' C. only escaped by his friend's ready wit. As a reply to Hogarth's caricature of Wilkes, he wrote the stinging *Epistle to Hogarth*, 1763; and when Martin forced a duel on Wilkes, he lampooned the aggressor in *The Duellist*, 1764. In Oct. 1764 he went to Boulogne to meet Wilkes, but was there taken ill and *d.* The best accounts of C. are by John Forster (*Historical and Biographical Essays*, 1858) and J. L. Hannay (prefixed to the Aldine ed. of the poet's works, 1866).

Churchill, John, *see* MARLBOROUGH, DUKE OF.

Churchill, John Spriggs Moss (1801-75), medical publisher who founded, 1825, the firm which still flourishes under his name. It was carried on by the next 2 generations of C.'s until A. W. C. *d.* in 1948. In 1934 it was made into a public company.

Churchill, Odette, *see* HALLOWES.

Churchill, Randolph Henry Spencer, more commonly known as Lord Randolph Churchill (1849-95), politician, the third son of the 6th Duke of Marlborough, and educ. at Eton and Merton College, Oxford, where he showed great intellectual powers. In April 1874 he married the daughter of Leonard Jerome of New York, and in the same year he was returned for Woodstock as the Tory member. In 1878 he attacked bitterly what he described as the 'old gang' of the Tory party, though he generally supported the policy of the Conservative Gov. The crushing blow which the Tories received at the general election of 1880, however, led to the formation of the Fourth party (q.v.). This party, founded and led by Lord Randolph, had for its object the vindication of

Conservative principles and the harassing of the 'old gang,' especially Sir Stafford Northcote. By this time C.'s speeches throughout the country had obtained for himself prominence as a politician and leadership in his own party. He began to advocate openly his principles of 'Tory democracy.' In Salisbury's first administration he was secretary of state for India. After the defeat of the Home Rule Bill and the disintegration of the Liberal party, he became chancellor of the Exchequer and leader of the House of Commons. His resignation in 6 months was due to his inability as chancellor to acquiesce in the vote for supplies for the army and navy, and he probably thought that the mere threat of resignation would bring the gov. to their knees. He was mistaken; his resignation was accepted, and the ministry continued and flourished. After this period he played no very active part in politics. His son, Winston Spencer C. (q.v.), wrote his life, 1906.

Churchill, Winston (1871-1947), Amer. author, *b.* St Louis, Missouri. He graduated from the U.S. Naval Academy in 1894, but did not pursue a naval career, turning instead to editing the *Army and Navy Journal* and the writing of novels dealing with Amer. hist. and politics, in which he was very successful. He was a member of the New Hampshire State Legislature from 1903 to 1905. He formed an association called the Lincoln Republican Club to reform local politics, but the club was dissolved after C. had vainly sought to become governor. As he and the well-known Eng. statesman had the same name, were of about the same age, and both had written books, many people often confused them. Apropos of this, the Englishman once wrote an amusing and charming letter to his Amer. namesake. The Amer. novelist's best-known books are *The Celebrity*, 1898, *Richard Carvel*, 1899, *The Crisis*, 1901, *The Crossing*, 1904, *Coniston*, 1906, *A Modern Chronicle* (a study of the conflicts between ideals and realities), 1910, *The Inside of the Cup*, 1913, *A Far Country* (on corrupt local politics), 1915, and *The Dwelling Place of Light*, 1917. After 1917 he went into retirement amid the New England mts, and wrote only one more book, *The Uncharted Way*, 1941.

Churchill, Sir Winston Leonard Spencer (1874-), statesman, soldier, and historian, eldest son of Lord Randolph C. (q.v.), *b.* 30 Nov. at Blenheim Palace. He was educ. at Harrow and Sandhurst, and entered the army in 1895. During the Sp.-Amer. war he served with the Sp. forces in Cuba. Between this date and the ending of the S. African war in 1902 he saw much active service: fighting in India, Egypt, and finally S. Africa. During the latter war he acted as the war correspondent of the *Morning Post*. On 15 Nov. 1900 he was taken prisoner by the Boers, but within a month succeeded in making his escape. In 1899 he contested Oldham in the Conservative interest. He won it the following year, at the 'khaki election,' and held it for

nearly 6 years. When Chamberlain's Tariff Reform was launched in 1903, C. was one of the active opponents of any change in the fiscal system. At the election of 1906 he won NW. Manchester in the Liberal interest. He had in the meantime been appointed under-secretary of state for the colonies in the Campbell-Bannerman administration, and proved one of the bitterest of opponents to the Conservative party. In 1908 he became president of the Board of Trade. He was, however, defeated at the by-election at that time necessitated by his appointment. He soon obtained another seat at Dundee. In 1910 C. was appointed home secretary. It was during his tenure of this office that C. had to deal with a serious strike in the S. Wales coalfield; and became a famous national figure as a result of his part in the Sydney Street affair (1911). He was home secretary for nearly 2 years, and was then appointed first lord of the Admiralty. In his pre-war work in that office he conferred frequently with Lord Fisher, then in retirement. The fleet's excellent state of preparedness on the outbreak of the First World War was due in great measure to C. On the recall of Lord Fisher to duty in Oct., he and C. projected a diversion in the E. The Dardanelles scheme was the outcome—later disapproved by Fisher. On Balfour taking the Admiralty, May, 1915, C. became chancellor of the Duchy of Lancaster, but not being included in the War Cabinet, he resigned in Nov., and spent the early part of 1916 as lieutenant-colonel commanding the 6th Royal Scots Fusiliers in Belgium. It was during this period, when C. was out of office, that he first took up painting seriously, selling his pictures under the name of 'Charles Morin.' In July 1917 he succeeded Addison as minister of munitions. He was an outstanding success. He accelerated the supply in larger quantities of the requisite shells and other munitions for the final allied advance of 1918. His greatest triumph in this office was the organisation of tank construction on a large scale. At the armistice he became secretary for war and for air, and in that capacity he lent troops and other aid to the White or anti-Bolshevist armies in Russia. Here he has since incurred much criticism, but it must be remembered that the anti-Bolshevists had been allies of the Entente before the close of hostilities in the First World War and that there were still various isolated allied units in the Russian theatres which had to be evacuated. C. was secretary for the colonies from early in 1921 until the coalition fell in Oct. 1922, and again there fell to him tasks of great urgency by way of aftermath of the First World War. In Ireland he pursued a vigorous policy during the Sinn Féin outrages of those years and advocated reprisals. Subsequently, however, the Cabinet reversed its policy and made terms with Ireland, C. taking a prominent part in the settlement made with the newly created Irish Free State. At the Colonial Office, too, C. had much to do with the setting up

of the mandatory rule of the Brit. Gov. in Iraq—a name substituted by C. himself for Mesopotamia as more in consonance with hist. and present boundaries—and in Palestine. In the general election of Nov. he lost his seat at Dundee to the Labour party, whom he had antagonised by a circular on military action in case of a general strike, which was characterised by his Socialist opponents as a strike-breaking device.

Subsequently C. stood for W. Leicester, and was again defeated by Labour. He



Karsh, Ottawa

SIR WINSTON CHURCHILL

dissented from the Liberal-Labour agreement to throw out the Baldwin gov., and stood as an Independent candidate in a by-election in the Abbey div. of Westminster, but was defeated by the official Conservative. Back again at the parting of the ways, he stood as a Conservative in the general election of Oct. 1924, and was elected for Epping. Baldwin made him chancellor of the Exchequer, and he so remained while Baldwin's ministry lasted. During the general strike of May 1926, C. ed. the gov. newspaper, the *British Gazette*. His budgets showed a gradual drift away from Free Trade, preserving and extending 'safeguards'; his last, 1928, was coupled with derating. Out of office once again, he was the chief critic of the National Gov.'s policy on the question of Indian autonomy; but in these ensuing years he is best remembered now for his repeated warnings on the rate of Ger. rearmament, to which he never ceased to direct the attention of the gov. and the nation, but with little effect until it was

too late. He was out of office from 1929 until the outbreak of the Second World War in 1939, when Chamberlain, bowing to popular demand, appointed him first lord of the Admiralty. In this office his influence was immediately felt in the steps taken to combat the submarine and mine menace—a task he had shouldered in the previous war under equally difficult circumstances. This was his old place in the Imperial War Cabinet during the First World War, but in the Second World War he became also head of a committee composed of the heads of the fighting services. The collapse of the Norwegian campaign early in May 1940 brought about the fall of Chamberlain after a dramatic debate (8 May), in which C. chivalrously supported his chief; but, while the gov. was nominally sustained by a majority of 81, it was obvious that when only 252 of 365 Conservatives in the House voted for the gov. the vote was in effect a heavy moral defeat for Chamberlain (q.v.). Chamberlain first tried to restore the gov.'s position by broadening the basis of his ministry, but Labour refused his offers. When he resigned on 10 May C., who in his career had held nearly every great office of state, at length achieved that of Prime Minister, combining the post with that of minister of defence.

Never was popular trust more justifiably reposed in a national leader; for C., then in his sixty-sixth year, was setting out on a brilliant tenure of 5 years during which his incomparable gifts as a statesman and strategist were seldom at fault, and when the greater the disasters which befell the allied arms the more surely did he rise to every occasion—always the buoyant spirit inspiring a whole people with his own resolution and unswerving confidence in the ultimate issue. It was a tenure which, beginning in the bitter prospect of 'blood, toll, tears, and sweat,' ended in the blaze of victory, only to be followed by the defeat of the gov. a few weeks later by the resumption of party strife and the defeat of the Conservative followers of C.—a reversal of fortune which was in no way a reflection on C.'s leadership, but the normal reaction consequent on the break-up of a coalition, the dominant party of which had been the Conservatives. Disasters soon came after C.'s assumption of office, for the country was almost entirely unprepared for a major war; but, in the midst of disaster, came the epic of the Dunkirk evacuation when C., tempering triumph with realism, warned the nation that 'victories were not won by evacuations.' In his new Cabinet of five (himself, Halifax, and Chamberlain representing the Conservative majority, with Attlee and Greenwood as representatives of Labour) C. continued to act as co-ordinator of the service depts in the capacity of minister of defence. More than the change in personnel, however, was the change in spirit, the new spirit which C. himself infused into the gov. and the nation. 'Victory at all costs; victory in spite of all terrors; victory, however long and hard the road may be, for without victory there is no

survival.' In Oct. 1940 C. accepted the leadership of the Conservative party, relinquished by Chamberlain.

The realism and effectiveness of C.'s policy in times of deepest stress and anxiety manifested itself after the collapse of France, in the face of the armistice concluded by Pétain (q.v.), which C. heard of with emotions of 'grief and amazement,' the 'terms of which might well strike a fatal blow at France's former ally.' For the Brit. Gov.'s acquiescence, albeit reluctant, in France's negotiation of a separate peace had been accompanied by one vital condition—that the Fr. fleet should be sent to Brit. ports and remain there during the negotiations; but in the result the Fr. fleet was preparing to go over to the Germans and to resist Brit. action to turn it from that course. At the battle of Oran, C.'s gov., having formally severed relations with the Pétain gov., succeeded in thwarting German hopes of acquiring this fresh accession of naval power (see NAVAL OPERATIONS IN THE SECOND WORLD WAR). Britain now had to fight on alone as 'the sole champions now in arms to defend the world cause. . . . We shall do our best to be worthy of that high honour' (C. on 17 June). And always, throughout the darkening hours, C. would make some characteristic utterance which will survive in the language—as, for example, in the Battle of Britain (q.v.), 'Never in the field of human conflict was so much owed by so many to so few,' in reference to the bravery of the Brit. pilots. C.'s most striking contribution, strategically, to the victory of the Allies probably lies in his Mediterranean strategy. He appreciated that the line through the Middle E. was the vital artery of the Brit. Empire; whence his anxiety to render harmless the Fr. fleet at Alexandria; whence, too, the 100 per cent reinforcements which the Brit. Mediterranean fleet received at the beginning of Sept. 1940 and his bold decision to send to the Middle E. Britain's one armoured div. The loss of Cyrenaica early in 1941 was a sore disappointment to C., the Brit. generals on the spot having underestimated the weight of the coming Axis blow, and when ultimately Rommel (q.v.) reached Egypt, C. acted with dramatic firmness. Always bold, he decided that Crete should be defended, it being his belief, erroneous as it transpired, that 'we had a good chance of winning the battle.'

Then C., faced with the seriousness of Britain's situation owing to the decline of shipping through heavy losses in the so-called battle of the Atlantic, called, in June 1941, on America for 'a gigantic building programme as the only true remedy,' and he did not appeal in vain; for, as C. had always said, 'if America would give them the tools, they would do the job.' C.'s relations with Roosevelt were, in the early years of the war, those of perfect mutual understanding and confidence. Towards the period when Ger. relations with America were growing more difficult owing to Roosevelt's policy of resistance far beyond America's territorial

waters, he and C. met on a warship in the Atlantic when, as the result of the famous if somewhat impracticable Atlantic Charter (q.v.), Amer. policy took a vital step forward. If the principles of the charter hardly came up to allied hopes, which indeed in the circumstances looked for a programme of immediate action, the charter's long-range policy of appealing to the conquered nations with the presentation of a programme to which they could rally as active allies of the democracies was well conceived. And at least C. could announce that Roosevelt had made it the joint purpose of America by decisive military victory to prevent another war, and that together they had 'jointly pledged their countries to the final destruction of Nazi tyranny,' a statement which was borne out by the President's subsequent course in speech and action. In a memorable invocation to the conquered after the Atlantic conference, C. said: 'Help is coming. Mighty forces are arming in your behalf. Have faith. Have hope. Deliverance is sure.' Memorable will always be C.'s prompt pledge of all aid to Russia made immediately on receiving intelligence that the Wehrmacht had invaded Russia, an offer more striking in view of C.'s unchanged views concerning Communism.

Again, when there were indications in Oct. 1941 that Japan was making preparations for further expansion in China, and before America had issued orders to withdraw the few Amer. marines then still in China, C. had promised immediate support if the U.S.A. should become involved in war with Japan. A month later C., accompanied by a staff of military and technical advisers, had arrived in Washington to confer with Roosevelt on their common defence so as to secure unified direction in the different theatres of operations and co-ordination between the various sectors of the far-flung battle fronts. The 'Pacific war' began disastrously for the Allies. In June 1942 C., with the Brit. chief of the general staff and other military authorities, made his second visit to America, for the express purpose of discussing the strategic situation with Roosevelt direct. Under C.'s lead the Brit. aerial effort against Germany was now growing apace, as was shown, for example, on the night of 30 May 1942, when over 1100 planes were concentrated in a mass attack on Cologne. This was followed by great daylight sweeps which further demonstrated the growing power of the R.A.F., a development which lent force to C.'s grim forecast that 'as the year advances Ger. cities, harbours, and centres of war production will be subjected to an ordeal the like of which has never been experienced by any country in continuity, severity, or magnitude.'

Difficult as was the path of the gov. in these fateful early years of the war it is possible to see the beginnings of the turn of the tide in C.'s decision to appoint Alexander as supreme commander in the Middle E. and Montgomery as commander of the Eighth Army (q.v.).

He had taken advantage of his visit to Moscow to investigate the situation in the Middle E. At the conference in Moscow, held early in Aug., C. with Stalin, together with various military leaders, had a 4-day discussion on strategic plans. C.'s changes in the Middle E. commands were soon followed by the remarkable Brit. victory at El Alamein (23 Oct.-4 Nov.), truly, with the concurrent battle of Stalingrad, the turning point of the war, though C. was quick to point out that the struggle was as yet far from over. In the matter of the 'second front,' it had been agreed between Britain and America to postpone an attack on Europe and to undertake an expedition to N. Africa, but it was left to C. to explain this delay to Stalin and to gain his acquiescence. One reason for the postponement was no doubt the increasing success of the Ger. submarine campaign. But, as C., in his report on the Casablanca Conference (Jan. 1943), had said, 'our duty to aid to the utmost in our power the magnificent, tremendous effort of Russia and to try to draw the enemy and the enemy air force from the Russian front was accepted as the first of our objectives once the problems of the U-boat war had been met in such a way as to enable us to act aggressively'—an assurance that was the key to all the plans and efforts of the Allies in the months that followed Casablanca.

C. fully supported the strategic task of night bombing imposed on the R.A.F., a policy that was certainly justified by its results. While at Washington in May 1943 C. took the opportunity of reassuring the U.S.A. that Britain's interests in the struggle with Japan were at least equal to those of the U.S.A. and that the British would wage war side by side with the Americans in accordance with the best strategic employment of their force—as full answer to those Amer. critics who were casting ill-founded doubts on Britain's readiness to aid America against Japan once Hitler had been beaten. C.'s strategical gifts were once again evident in the conduct of the campaign in Italy in 1943, though there were critics who (then, and subsequently) thought that valuable time had been lost between the fall of Mussolini and the delivery of the major assault on the mainland of Italy, a charge which C. vigorously refuted by the valid defence that the 'condition and the preparation of the landing craft were the sole and decisive limiting factors.' What is important to recognise is that C. never regarded the N. African operation and its sequel in Italy as a substitute for a direct attack across the Channel upon the Germans in France or the Low Countries, but only as an essential preliminary to the main attack on Germany and her ring of subjugated and satellite states. With C. and his advisers the second front existed and was a main preoccupation already with the enemy, and 'on the day,' he said, 'when we and our Amer. allies judge to be the right time this front also will be thrown open and thrown into play, and a mass invasion of the Continent from the W. and S. will begin'—a promise

which was fulfilled in ample measure on D day in June the following year. Of all the conferences between C. and Roosevelt the Quebec Conference (which began on 11 Aug. 1943) was the most comprehensive; for then fundamental agreement on immediate ends was arrived at, including action in China, though once again, as at Casablanca, no Russian representative was present, the main cause of Stalin's impatience with his allies being the continued absence of a second front in W. Europe. In Nov.-Dec. 1943, however, Stalin, Roosevelt, and C. met at Teheran to discuss their common war policies. Shortly after this C. was taken gravely ill, but by Christmas was well enough to attend a conference of military commanders at Tunis.

In the flying bomb period, in 1944, C. scorned the idea that Parliament should transfer its location to some safer city and called upon all who had duties in London to remain at their posts. The internecine strife in Greece in 1944, coming on top of the political incidents in Italy of 1943, engendered in some political circles in Britain an idea that as victory was approaching C.'s policy was inclining to the support of politically bankrupt regimes in Europe as against the popular forces which had emerged; but the main preoccupation of C.'s gov. was to maintain order in Greece and safeguard the distribution of food supplies. But fighting still continued in Athens, and to restore confidence in the gov. C., with Eden, foreign minister, flew on Christmas Eve to Athens. The results of his visit, however, were less spectacular than the visit itself, though C.'s presence there restored the confidence of the Gk people in Britain's good intentions. In this year (1944) C. also visited the battle front in France, and indeed it was a feature of his premiership that he was often overseas, whether at vital conferences or in theatres of war. On 10 Sept. C. went once again to Quebec to confer with Roosevelt, and there he and the President reached decisions on all points respecting the completion of the war in Europe and the destruction of Jap. power in the Pacific. Less than 3 weeks after his return from Quebec C. left England again for Moscow, accompanied by Eden and members of the general staff. This conference (Oct.) was the sequel to Quebec, the discussions concerning, chiefly, their common problems in E. Europe. In Feb. 1945 C. went to the important conference at Yalta, in the Crimea, where, with Roosevelt and Stalin, the Allies drew up a plan for the final defeat of Germany, and the occupation and control of that country after her unconditional surrender. The conference also reaffirmed the Allies' common determination to maintain in the peace the unity of purpose and action which had made victory certain; but in the sequel at Paris in 1946, many months after C. had resigned, it soon became evident that the policies of the W. democracies and Russia were entirely divergent. It was later clear, too, that the W. had been unintentionally weakened

by the fact that, towards the end of his life, Roosevelt had failed to give C. his whole-hearted support on a number of strategical matters, placing what would in retrospect appear to have been an undue faith in Stalin's disinterestedness in the internal affairs of the countries Russia was to 'liberate.' The ultimate delimitation of Germany's boundaries was considered by a 3-power conference at Potsdam on 16 July 1945 between C., President Truman, and Stalin, but certain changes had then already taken place, and in the Commons in Aug. 1945, after the change of gov., C., in the debate on the King's Speech, said, as to the results of that conference, that it would be impossible to conceal the divergence or view which existed about the state of affairs in E. and Middle Europe. Early in April (1945), as victory was approaching, the exchange of recriminations between Conservative and Labour ministers heralded the break-up of the coalition.

The end of war with Germany brought C. face to face with the question whether the time had come for a dissolution of Parliament or a general election. C. sounded the Labour leaders on the possibility of continuing the Coalition Gov. until the end of the war with Japan, but their response was unfavourable, though they were willing to remain in the gov. until the end of the session in Oct. On 25 May C. formed a new gov. (the 'Caretaker Gov.') almost exclusively of Conservatives. Parliament was prorogued on 15 June and immediately afterwards formally dissolved. In the ensuing election campaign C. toured the provs. and was everywhere greeted with unbounded enthusiasm; but his audiences in many cases made it evident that they intended to draw a sharp line between his personality and the policies advocated by his party. In London he toured certain critical constituencies, but while his reception was again most enthusiastic, the dissent from his political views was even more marked. It cannot be said that in this campaign C. really rose above the partisan, his broadcast address on 30 June on the relations between the Labour party executive and Labour ministers, and in particular on the influence of the Labour 'caucus,' being all too reminiscent of the 'Zinoviev Letter' tactics of 1924. The results of the election disclosed a great victory for Labour. On 26 July C. resigned. In the debate on the Address from the Throne (Aug. 1945) the new Labour Prime Minister (Attlee) paid a warm tribute to C. for his services as a war leader. 'His had been,' said Mr Attlee, 'a true leadership which meant the expression by one man of the soul of the nation and its translation of the common will into action.'

The next 6 years of C.'s life were spent in opposition. He made sev. telling speeches, both in and outside Parliament, in criticism of the Labour Gov.'s internal policy; but he gave it his wholehearted support in matters of foreign affairs, and foreign policy during the period 1945-51 was, therefore, completely bipartisan.

In 1950 the Conservatives gained sev. seats in the general election, but Labour still held a majority, although only a slender one; 18 months later, at the next general election, the Conservatives returned to power. C. was Prime Minister once again.

His peace ministry was a great personal triumph. It saw the end of the Korean war, and an apparent lessening of the 'cold war'; at home the country's economy made a pronounced revival. In 1953 he was created K.G. In April 1955 C. resigned from the premiership, being succeeded by Anthony Eden (q.v.). C. was now over 80; the previous year his eightieth birthday had been celebrated by numerous presentations, and he now retired to give place to a younger man. At the general election in May 1955 the Conservative majority actually increased—a very rare achievement for a party already in power and one which fittingly set the seal on C.'s political career, for the result was at least as much an approval of C.'s policy as a mandate for his successor. He has since remained in Parliament as M.P. for Woodford.

C. married in 1908 Clementine Hozior; they had 1 son (Randolph C., b. 1911, a former Conservative M.P., and subsequently a political journalist) and 3 daughters.

Pub. works: *Lord Randolph Churchill* (1906; *The World Crisis* (4 vols.), 1923–1929) abridged and revised ed. in 1 vol., 1931; *Marlborough* (4 vols.), 1933–1938; *Great Contemporaries*, 1937; *Into Battle* (speeches), 1941; *The Unrelenting Struggle* (speeches), 1942; *The End of the Beginning* (speeches), 1943; *Onwards to Victory* (speeches), 1944; *The Dawn of Liberation* (speeches), 1945; *Victory* (speeches), 1946; *Secret Session Speeches*, 1946; *Sineus of Peace* (speeches), 1948; *Painting as a Pastime*, 1948; *The Second World War* (6 vols.), 1948–54; *A History of the English-Speaking Peoples*, 1956–8. For biographies of C. see C. Bechhofer Roberts ('Ephesian'), *Life of Winston Churchill*, 1927; H. Martin, *Battle* (a detailed study), 1940; Sir G. Arthur, *Concerning Winston Spencer Churchill* (character and opinions rather than achievements), 1940; R. Sencourt, *Winston Churchill*, 1940; W. S. C., *a Cartoon Biography* (compiled by F. Urquhart), 1955.

Churchill River rises in Lake La Loche (or Mothy), Canada, between R.s Athabasca and Saskatchewan, flowing through various lakes into Hudson Bay, near Churchill, Manitoba. It forms the only harbour on the W. of Hudson Bay for large vessels at all states of the tide (6–8 fathoms deep), but has rapids only navigable by canoes 5 m. from the mouth. Lake Reindeer or Caribou connects it with Wollaston or Great Hatchet Lake and Mackenzie R.; La Loche portage with the Athabasca's trib., Clearwater. Known as C. R. as early as 1688 (probably after Lord Churchill—Marlborough). It is also called Missinnippi, English, or Baver R. It is about 900 m. long.

Churching of Women, public thanksgiving in church for motherhood and

recovery from the perils of childbirth. This religious usage (probably borrowed from the Jewish law, Lev. xii. 6) has prevailed in the Christian Church from early times. Among Protestants it is falling into disuse, though still obligatory in the Gk. and Rom. Catholic Churches, and ordered in the Anglican prayer book. Presbyterian and Independent Churches of Britain and America reject the service. The Gk rite also celebrates the presentation of the infant in the Church; the Lat. is exclusively a blessing on the woman (if her child is born in wedlock). The first definite mention is in the pseudo-Nicene Arabic canons. The formularies now used date only from medieval times.

Churchite, see CHURCH, SIR ARTHUR HERBERT.

Churchwardens are lay eccles. officers, who represent the body of the par., and are, as their name implies, guardians of the church. Under the New Parishes Measure, 1943, which consolidates the Church Buildings Acts and New Parishes Acts of the 19th cent., 2 C. are chosen annually at a joint meeting of the Parochial Church Meeting and the Vestry (i.e. persons rated in respect of property in the par.), either by joint consent of the incumbent and the meeting or one is chosen by the incumbent, and known as the rector's or vicar's warden, while the other, known as the people's warden, is elected by the meeting. The election should take place in Easter week (Canon 90 of 1603). They are admitted to office by the ordinary, usually the bishop of the diocese, after making a declaration that they will perform their duties in good faith. In early times the *seniores ecclesiastici* merely had charge of the fabric and furniture of the church. This is still their main function, and the property in the goods of the church is vested in them. But the Parochial Church Council, of which they are usually *ex officio* members, has the care, maintenance, and insurance of such goods. C. must also maintain order in the church and churchyard, and may remove persons who disturb divine service or arrest persons guilty of bad behaviour in the churchyard. They have the duty of assigning seats in church to the parishioners. During the vacancy of the benefice they frequently act as sequestrators. In general every householder in the par. and persons on the church electoral roll, even, though living outside the par., are eligible. A person who is not a communicant may be elected, but is debarred from membership of the Parochial Church Council. Minors, aliens, Jews, and persons convicted of felony, perjury, or fraud are disqualified.

Churchyard, Thomas (1520?–1604), poet, began his career as a page to the Earl of Surrey, served as a soldier in various wars, and was given a pension by Elizabeth I. He produced a number of broadsheets, his best poems being *Shore's Wife*, 1563, *Churchyard's Chips*, 1575, and *The Worthiness of Wales*, 1587.

Churchyard, name of a piece of consecrated ground attached to a parochial

church (thus differing from a cemetery), used as a burial-place. C.s are often of earlier date than the church itself, since Rom. law protected any area containing monuments of the dead with the utmost reverence. Burial in C.s in England is ascribed to Cuthbert, Archbishop of Canterbury (741-58). All Christian services may now be used at C. burials (Vict. 43, 44, chap. 41). The C. is the freehold of the parson. It may never be used for secular purposes, and misbehaviour of any kind within its precincts can be severely punished by law. See also *under* BURIAL ACTS.

Churl, see CEORL.

Churn, vessel or utensil for the purpose of making butter, by shaking the cream and so separating the serous from the fatty parts. The form of C. which for long held its position was an upright wooden vessel, shaped like a travelling metal milk can, in which the cream was worked by a wooden plunger by hand. To this succeeded a wooden box, in which moved a splashers, or dasher, a small wooden wheel like a water wheel, turned by a crank by hand. Large C.s are now turned by machinery, and revert in a way to the primitive form by being revolved or swung on themselves by mechanical means. Good C.s should be of seasoned oak-wood, and so constructed with removable splashers or dashers that they can be easily and thoroughly cleansed after use. In modern large C.s glass lights are fitted through which the butter can be watched as it begins to form, and the exact moment for withdrawing the buttermilk be ascertained. C. is also commonly used as a term describing the metal containers in which milk is collected and transported. See BUTTER and DAIRY.

Churubusco, residential suburb S.E. of Mexico City, on the site of the pre-conquest Aztec city dedicated to Huitzilopochtli. C. was a stronghold of Mexican defence against the Amer. troops under Gen. Scott at the important battle of C. on 18 Aug. 1847, during the Mexican war.

Chusan Islands form an archipelago off the E. coast of China. The largest, C., is 20 m. long and from 6 to 12 m. wide; it is regarded as the key to China. There are sev. tns. of which the cap. is Tinghai. Pop. 250,000.

Chute, *Marchette Gaylord* (1909-), Amer. biographer, b. Minnehaha Creek, Minneapolis. She was educ. at the Univ. of Minnesota. Her earliest pub. were books of verses for children, but she became famous for her vivid biographies of old writers: *Geoffrey Chaucer of England*, 1951, *Shakespeare of England*, 1951, and *Ben Jonson of Westminster*, 1953.

Chutney, **Chutnee**, or **Chutny** (Hindu *chāṭni*), E. Indian condiment made of mangoes, chillies, or capsicum, and lime-juice, with other native fruits, such as tamarinds or ginger-root. The flavour is often heightened by garlic. It is now manuf. for sale in the W., like pickles. Home-made C.s are often made with

various fruits, acids, and spices, tomato flavouring being very common. The chief ingredients generally used are chillies, green ginger, crushed tamarinds, apples, sultana raisins, distilled vinegar, shallots, cayenne pepper, fine salt, garlic, and cucumber. See J. Forbes, *Oriental Memoirs*, II, 1813; and for detailed recipes any modern cookery book.

Chuvash Autonomous Republic lies in the N. of the Volga upland, between Gor'kiy and Kazan', and consists of ravined wooded steppe with mixed forests in the SW. and N. There are phosphorite deposits, grain and potato growing, livestock breeding, sawmilling, woodworking, and chemical and food industries. A large hydro-electric station (800,000 kW.) is under construction. The prin. tns are Cheboksary (cap.) and Alaty'. The area was annexed to Russia with the conquest of Kazan' (1552); C. Autonomous Oblast was formed in 1920, and transformed into an autonomous rep. in 1925. Area 7100 sq. m.; pop. (1956) 1,095,000, mostly Chuvashes and Russians.

Chuvashes, Turkic-speaking people living in the Chuvash Autonomous Rep. (where they form three-quarters of the pop.) and the surrounding areas of European Russia, numbering (1939) 1,400,000. They probably descend from the medieval Volga Bulgarians (q.v.), are Christian and to a considerable extent Russianised. A Chuvash alphabet dates from 1872. The majority of C. are peasants working on collective farms. See W. Kolarz, *Russia and her Colonies*, London, 1952.

Chüyungkuan, customs station in the Nankow Pass of the Great Wall, 30 m. N. of Peking, China. It possesses a polyglot inscription.

Chyle, milky-looking fluid passing through the lacteals, which are the vessels which absorb fat from food passing from the smaller intestine. The liquid, which consists of a mixture of these fat globules with the natural juice, passes from the lacteals into the thoracic duct. Chyluria is the passage of C. with the urine. It is commonly caused by the presence of the parasitic *Filaria sanguinis-hominis* in the blood and lymph channels. **Chyme** is the pulpy mass into which food is converted in the stomach prior to its separation in the small intestines. See *under* DIGESTION and FILARIASIS.

Chynar, old fortress and tn in Bihar state, India, 20 m. from Mirzapur, on the r. b. of the R. Ganges. It was the scene of much fighting in Mogh. times. It was stormed by Brit. forces in 1764 after the battle of Buxar (q.v.).

Cialdini, **Enrico** (1811-92), It. general and politician, who in 1860 won the battle of Castelfidardo. In 1861 he forced Gaeta and Messina to yield, for which services he was created Duke of Gaeta.

Ciamician, **Giacomo Luigi** (1857-1922), It. chemist, b. Trieste, educ. at Univ. of Vienna. Assistant at Chemical Institute of Rome, 1880; prof. of general chem., Padua, 1887. From 1889 ordinary prof. of general chem. at Bologna. Senator, 1910. Works include *Organico*

e fisiologico chimica, 1908, and *Fotochimica nell' avvenire*, 1912.

Ciampoli, Domenico (1855-1929), It. writer, b. Atessa, in the Abruzzi. He was a prof. of literature at Ancona, and has written some stirring novels which represent the life of the natives in the Abruzzi, such as *Conti Abruzzesi*, 1880, *Trece Nere*, 1882, and *Cicula*, 1884. Other novels are *L'ignoto*, 1883, and *Roccamorina*, 1890, besides various works on Slav literature, as the *Melodie Russe*, 1881, and *Lettérature Slave*, 1889-90.

Ciandiana, tn in Sicily (q.v.), 12 m. NW. of Agrigento (q.v.). There are sulphur mines in the vicinity. Pop. 8000.

Ciano, Galeazzo, Count (1903-44), It. Fascist leader, son of a naval officer and ex-president of the Chamber of Deputies, educ. in Rome. C. supported the Fascist movement from the beginning; he married Edda, daughter of Mussolini, through whom he acquired much of his influence. He was under-secretary of state for propaganda, 1934. In the Italo-Ethiopian war he served as an air pilot, commanding a squadron. In 1936 he was made foreign minister, and in 1937 he signed the Anti-Comintern Pact (q.v.) on behalf of Italy and also, in 1939, the Italo-Ger. military alliance. In 1943 he was dismissed from the foreign ministry, and later that year voted against Mussolini. His later activities are obscure, but in Jan. 1944 he was brought to trial at Verona. Mussolini, though by that time devoid of any real power, wanted to avenge himself on the men who, he supposed, had brought about his downfall, and on 11 Jan. 1944 C. was shot. See M. Muggoridge (ed.), *The Ciano Diaries* (1939-43), 1947, and *Ciano's Diplomatic Papers* (1936-42), 1948 (a record of the Nazi-Soviet alliance as well as of contemporary It. foreign policy).

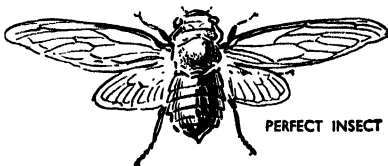
Cibber, Caius Gabriel (1630-1700), Dan. sculptor, who came to England and worked at Chatsworth for the 4th Earl of Devonshire, under whom he fought for William of Orange, who made him royal carver. His son, Colley C. (q.v.), was the well-known actor and dramatist. His most famous works are the statues of 'Melancholy' and 'Raving Madness,' the bas-reliefs on the Monument, and the phoenix over the S. door of St Paul's. The Dan. church in Stepney (demolished in 1860), where he was buried, is supposed to have been built by him.

Cibber, Colley (1671-1757), actor, dramatist, poet, b. London, son of the above. Educ. at Grantham, he served in the Earl of Devonshire's levy for the Prince of Orange in 1688. In 1690 he joined the Theatre Royal, Drury Lane, where he had his first success, playing the part of the chaplain in Otway's *The Orphan*. In 1695 his first play, *Love's Last Shift*, or *The Fool in Fashion*, was produced, and it was so successful that Vanbrugh wrote a sequel to it, called *The Relapse*, in which C. made a big hit as Lord Foppington. He wrote numerous plays, and took many parts, in pieces by himself and others. *The Careless Husband*, 1794, was, in the opinion of Horace

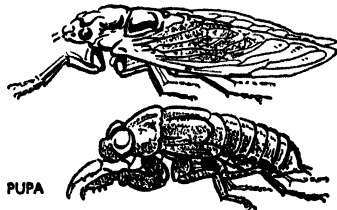
Walpole and others, C.'s best play. C. initiated the reaction from Restoration drama by introducing a moral tone into his comedies, but his heart was with the actors. He was at his best in eccentric comedy, his voice being too thin for declamatory roles. In 1709 he became a joint proprietor of Drury Lane, and he was the first manager to run a theatre on strictly business lines. After the death of Eusden in 1730 he was appointed poet laureate, less, as he himself freely admitted, for his literary merits than for his political activities on behalf of the Whigs. In 1740 he pub. *An Apology for the Life of Mr Colley Cibber, Comedian*. This entertaining work is the prin. authority for his life. See F. D. Senior, *The Life and Times of Colley Cibber*, 1928, and R. Barker, *Mr Cibber of Drury Lane*, 1939.

Cibber, Susannah Maria (1714-66), wife of Theophilus C., actor, and sister of Dr Arne, the composer. She started as a singer, was the original Galatea in Handel's *Acts and Galatea*, and sang in the original production of Handel's *Messiah*. Afterwards she became famous as a tragic actress, and played with David Garrick at Drury Lane.

Ciborium: 1. Covered cup to contain the eucharistic bread. 2. Canopy over an altar (see BALDACHIN).



PERFECT INSECT



PUPA

CICADA

Cicada, family of hemipterous insects of the sub-order Homoptera; the species usually inhabits tropical countries, America being especially favoured by its presence. These insects vary in size from 1 to 7 in. across, and are remarkable for their longevity and for their song. The male utters a curious sound, by some thought agreeable and by others intensely displeasing, by means of a peculiar apparatus on the abdominal and metathoracic segments; it was heard by Darwin when he was on the *Beagle* a quarter of a mile from shore, and inspired the saying of the Gk poet Xenarchus: 'Happy the cicadas' lives, for they have

voiceless wives.' *C. tibicen*, the dog-day harvest-fly, is a black and green species which infests N. America in summer, and utters a shrill cry in the noontide hours; *C. septendecim*, the periodical C., is noted as the longest-lived insect, for the perfect creature requires 13 to 17 years for its development. The eggs are placed in the slits of twigs by the ovipositor of the female, and the larvae are always subterranean. They are said to damage roots, and are in process of extinction.

Cicatrization, process of healing over of a wound or broken surface in the skin or the mucous membrane, in which process the original surface is replaced by a material of a fibrous texture and resistant nature. This effectually covers and protects the portion of flesh which was exposed, but contains no glands or blood vessels which were present in the original tissue. The end result of C. is a scar.

Ciccio, l'Abate, see SOLIMENA, FRANCESCO.

Cicendia, genus of plants in the family Gentianaceae, containing 2 species, one S. Amer., the other *C. fliformis*, the gentianella, a yellow-flowered plant found in damp sandy places of S. England and Ireland, and W. and S. Europe to N. Africa and Asia Minor.

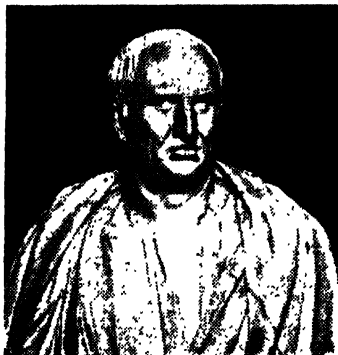
Cicer, genus of leguminous plants, allied to the vetch. The best-known species is *C. arretinum*, popularly called the gram or chick-pea (q.v.).

Cicero, Marcus Tullius (106-43 BC), Rom. orator and statesman, great in the former capacity as he was ineffectual in the latter. C. was b. Arpinum, the elder son of a knight. Together with his brother Quintus, he received his early education in Rome, where the poet Archias of Antioch and Phaedrus the Epicurean were among his teachers. After assuming the *toga virilis* in 91 he did a period of military service during the social war, and continued his studies—dialectic under Diodotus the Stoic, law under the two Scaevolae, and rhetoric under Molo of Rhodes. In 88 he also attended the lectures of Philo, head of the New Academy, by which school he was profoundly influenced in later life. C.'s forensic career opened in 81 BC with the speech *Pro Quinctio*, which was followed in the next year by his defence of Sextus Roscius. C. spent the years 79-77 in the E., partly for reasons of health, but partly too for the sake of further study, which included a final and decisive course of rhetoric under Molo, who had returned to his native Rhodes. At Athens he met and won the lasting friendship of T. Pomponius Atticus (q.v.). Back in Rome, he married his first wife Terentia, a domineering woman of uncertain moods, and became actively engaged in political life. C. was quaestor in Sicily in 75, and 5 years later he prosecuted Gaius Verres. As praetor in 66 he delivered his celebrated speech *pro lege Manilia* (see POMPEIUS). Two years earlier saw the beginning of his famous letters, which give us an extraordinary insight into the hist. and the manners of the time. C. was not yet certain of political support, especially

of the senatorial party, and for some time he thought seriously of throwing in his lot with the democrats; but finally the senatorial party decided to support him, and he remained true to their cause for the rest of his life. In 63 he was consul. He was not, however, well supported by the nobility, who always remembered that he was not the descendant of one of the noble families. His year of office was crowded with events, his chief speeches being those made against Publius Rullus and Catiline (q.v.). The case of Rabirius Postumus found him deserted by the senatorial party, and since he had rejected the overtures made by Caesar (q.v.), he was forced into exile (58). Recalled in the following year, he found that his property in Rome had been destroyed at the instigation of Clodius (q.v.); and although he was enthusiastically welcomed by the people, he could obtain no redress for his losses. The next 5 years were devoted largely to literature; and when he did intervene in public life, it was only to flounder pathetically from one error of judgment to the next. In a letter written at this unhappy time, C. frankly confesses: 'I have behaved like a perfect ass.' In 52 he defended Annus Milo (q.v.), who was charged with the murder of Clodius, and in the same year he was sent to govern the prov. of Cilicia. He put down several risings in that prov. and did his best to alleviate the distress which existed there. In 50 he returned to Rome, but did not enter the city. He found that war was inevitable, and threw in his lot with Pompey, taking, however, no very active part in the war, and finally returning to Rome in 47, on the invitation of Caesar. During the latter's dictatorship he refrained from politics, again devoting himself to literature. At this time he also suffered much from domestic troubles; he divorced his wife, Terentia, and married his ward, whom also he shortly afterwards divorced; his greatest sorrow, however, was the death of his daughter, Tullia.

For some time after Caesar's murder C. took no part in politics, but was gradually to resume his role. He became the acknowledged leader of the republican party, and relied for safety on the influence which he felt he had over Octavian. In 43, however, he was amongst the proscribed, and on 7 Dec. of that year he was slain. His head was exposed in Rome, and there Fulvia, the wife of Antony and widow of Clodius, thrust a bodkin through his tongue. His chief philosophical works are *De Oratore*, *De Republica*, *Brutus*, *Orator*, *Academica*, *De Finibus*, *Tusculanae Disputationes*, *De Natura Deorum*, *De Senectute*, *De Amicitia*, and *De Officiis*. Among his most notable speeches are the Verrine orations, the defence of Cluentius, the 14 orations against Mark Antony (the *Philippics*), and the defence of Milo. His political works include 56 speeches, all professing to have been delivered in the forum or the curia, though some of them, as, for example, that for Milo and the greater number of the *Philippics*, were

written for pub. but not actually delivered. C.'s letters remain without doubt the most valuable of all his writings. They fall into 3 groups: *Ad Atticum*, *Ad Familiares*, and *Ad Quintum Fratrem*. The best complete ed. of C.'s complete works is that of C. F. W. Muller and others (1869-96). Eds. and trans. of separate works are numerous. See especially the complete *Letters* ed. by R. Y. Tyrrell and L. C. Purser (1904-18). See also F. R. Cowell, *Cicero and the Roman Republic*, 1948.



Anderson

CICERO

A bust in the Capitoline Museum, Rome.

Cicero. Marcus Tullius (b. 65 BC), only son of Marcus Tullius C., the great orator, and his wife Terentia. In 44 BC he joined the republican party and served as military tribune under Brutus in Macedonia. After the battle of Philippi, 42 BC, he fled to Sicily, where he joined Sextus Pompeius, but on the conclusion of peace between the latter and the triumvirs in 39 BC he returned to Rome. Octavian received him as his colleague in his consulship of 30 BC. Nothing more is known of him.

Cicero, Quintus Tullius (c. 102-43 BC), younger brother of Marcus Tullius C. He was aedile in 67, praetor in 62, and for 3 years governor in Asia, where his vile habits earned him an evil reputation. He distinguished himself as one of Caesar's officers in Gaul. In the civil war between Pompey and Caesar he joined the former, but later deserted him and reinstated himself with Caesar. He was put to death in the proscriptions of 43 BC.

Cicero, industrial tn in NE. Illinois, U.S.A., with large telephone, radio, and electrical equipment plant. Steel, iron, copper, and brass products; home appliances, building materials, tools, hardware; clay, rubber, asbestos, and wood products; paints, varnishes, clothing, and musical instruments are manuf. Pop. 67,500.

Cicerone, guide, especially for galleries

of art or museums or other places of historical interest. The term was first applied in Italy to antiquarians and men of learning, and is supposed to be derived from Cicero as typical of such.

Cicaster, see CIRENCESTER.

Cicindelidae, family of coleopterous insects in the section Adepaga, consists of active, voracious, and terrestrial species commonly known as tiger-beetles. Their colouring is generally rich and metallic, and the insects are to be found on sandy plains or heaths, sometimes on the seashore or the shore of rivers.

Cicisbeo, It. word applied to a gallant who waits upon a married woman. Among the higher ranks of It. society it was formerly the fashion for a C. to be in daily attendance upon the married lady of his choice, who could never be seen in public with her husband. The word is synonymous with *cavaliere servente* and *patito*. It originally meant a knot of ribbons, hanging on to the hilt of a sword or to the handle of a fan.

Cicuta, genus of highly poisonous umbelliferous perennial herbs, of which *C. virosa*, Cowbane, is found locally in shallow water, ditches, and marshes in Britain, N. and C. Europe, and Asia.

Cid, The, historical and legendary hero of Spain. The legends which have accumulated round his name for a time gave rise to the theory that he was a purely mythical character, but it has since been proved that he existed, although his deeds, great as they were, are not actually identical with those with which he is credited. New research, much of it into Moorish sources, often lends surprising confirmation to the historical accuracy of the *Poema de Mio Cid* (q.v.). Thus a recently discovered passage by Ben Al-lathib not merely confirms the C.'s victory at Cuarte, in Valencia, but describes in detail the strategy ascribed to him in the poem. He was b. during the fourth decade of the 11th cent., of a noble Castilian family. He reached manhood just at the time when Ferdinand died and left his dominions divided amongst his 5 children. He became a prominent supporter of Sancho of Castile; Spain at this time was equally divided amongst the Moors and the Spaniards. The Moors also, freed from allegiance to the caliphate, were divided up into small and independent states, continually quarrelling amongst themselves as well as with the Spaniards. The Spaniards, moreover, were not in a very united state. The C. plunged into the wars of the period; he won the title of Campeador by his valour in fighting against Navarre, and he supported Sancho of Castile against his brother Alfonso. Whilst journeying to Seville to collect tribute from one of the subject Moorish rulers, he took part in the fight against the King of Granada, whose forces he was responsible for routing. Returning to Burgos, he found himself the victim of a plot and was forced into exile (c. 1075). After this date the C. became the captain of a free company. He sold his services, now fighting for the Moors, now for the Christians. His

valour as a warrior and his capability as a general cannot be doubted, but although he made many attempts to reconcile Alfonso of Castile, his career at this time must be regarded in the light of a mercenary and not a national patriot. He led a successful expedition against Valencia, and for some time ruled over Valencia and Murcia. The Almoravides, whom he had defeated on more than one occasion, at length rose once more against him, and although he was not personally defeated, his army and chief lieutenant were. In 1099, worn out with war and grief, he died. The city of Valencia held out for yet another 3 years, and at the end of that time his body was taken to Burgos and there buried. He has been regarded always as the national hero, and within a cent. of his death legend after legend had sprung up concerning him. Over 200 ballads still exist which have him for their hero, and which ascribe to him all sorts of wonderful and heroic adventures. See Southey's *Chronicles of the Cid*, 1808; R. Menéndez Pidal, *La España del Cid*, 1948; Wm Merwin (translator), *The Cid*, 1958.

Cider, alcoholic beverage made from the juice of apples. The proportion of alcohol depends on the composition of the fruit employed, the method by which fermentation is carried out, and any subsequent treatment, such as blending and sweetening. In England C. contains from 2 to 8 per cent of alcohol, but special C.s made from juice with added sugar may contain 10 per cent or more. C.s containing a large proportion of unfermented sugar are known as sweet C.s, those containing little sugar are known as dry C.s and the term rough is applied to those dry C.s that contain some acetic acid. The chief C. dists. of England are the cos. of Hereford, Devon, Somerset, and Glos, and to a less extent, Worcs, Kent, and Norfolk, with a C. acreage of (1954) 40,000; some C. is made in Ireland; large quantities are made in the N. districts of France and in Switzerland; some is made in Germany and in Spain. In the U.S.A. the term C. is applied to unfermented apple juice; limited amounts of C., termed hard cider, are made. The premier C. apple is Kingston Black; others well known are Yarrington Mill, Dabinett, Bulmer's Norman, and Slack-ma-Girdle. The apples used are grown for that purpose, mainly in farm orchards, and they are usually unsuitable for eating on account of their high acidity, bitterness, or astringency. The apples are crushed in a mill and the juice is pressed out from the pulp or pomace. The juice is allowed to ferment spontaneously in casks or tanks at ordinary temp. The casks are kept full, and, after the froth has subsided, an air lock is inserted to keep air away from the C., as this would lead to acetification, and the C. would become vinegary. The period of fermentation may last from a few weeks to sev. months according to the fruit used; after this the C. is syphoned from the lees or yeast deposit and stored in a cool place; it may be racked again in a few months. The good quality of C.

depends upon the choice of fruit used, a satisfactory fermentation, with freedom from acetification or other disorders, and cool storage. Its flavour should be balanced in sweetness, acidity, and astringency; the preferred flavour varies from one dist. to another. C. has long been the favourite beverage of the inhab. of the fruit-growing dists. and it is still made by the farmers: it is also produced in the U.K. in C. factories to the extent of many millions of gallons annually. C. research is carried out at the Long Ashton National Fruit and C. Institute. Of recent years in England sev. manufs. have bottled apple juice products of a teetotal nature under brand names derived from C.; these are extremely palatable, and often so closely resemble sweet C. that only an expert could detect the difference.

Ciechanów, tn of Poland, in Warsaw prov., 50 m. NNW. of Warsaw (q.v.). It is a railway junction and agric. centre, and has pottery and foodstuff manufs. Pop. 12,000.

Ciego de Avila, tn in the prov. of Camagüey, Cuba, a commercial centre, with sugar factories. Its port is Júcaro (15 m. SSW.) on the Caribbean. Pop. 23,800.

Cielo Dalcamo, or Ciullo D'Alcamo (beginning of 13th cent.). It. poet, b. Alcamo near Palermo. He was one of the first to write poetry in Italian. Of his works only one poem remains, written between 1231 and 1250. This is a spirited dialogue of 32 stanzas between lover and lady, and was trans. by Rossetti in *Dante and his Circle*. It is one of the liveliest poems of this period. See F. Torraca, *Studi sulla lirica ital. del Duecento*, 1902, and A. Monteverdini, *Studi medievali*, 16, 1943.

Ciénega, or San Juan de Ciénega, port in Magdalena dept, Colombia, near the mouth of C. Grande, or lagoon of Santa Marta. It exports bananas. Pop. 22,800.

Cienfuegos, tn in Las Villas prov., Cuba, on S. coast and 140 m. ESE. of La Habana. It is situated on a fine, sheltered bay, and is an important seaport of Cuba. It has an active trade in sugar and tobacco products. Pop. 52,900.

Cieszyn, tn of Poland, in Katowice prov., on the Olza, 40 m. SSW. of Katowice (q.v.). It is divided by the riv. from the Czechoslovak tn of Těšín (q.v.), with which it once formed one tn (see TESCHEN). There are coal mines in the dist., and there are engineering and paper industries. Pop. 15,000.

Cieza, Sp. tn in the prov. of Murcia, on the Segura. It lies on a plateau surrounded by mts, has a ruined Rom. fort, and a trade in grain, wine, olives, and fruit. Pop. 24,400.

Cigala, Lanfranco (c. 1218-78), It. poet, b. Genoa. He wrote some religious verse, and poems dealing with political subjects, such as Louis IX and his crusade. In his love lyrics, which are of a delicate beauty, he writes about 2 Provençal ladies, Adalais de Vidalhana and Salvaja. Only 30 of the poems have been preserved, and these have never been critically ed.

Cigar, roll of tobacco leaf for smoking purposes. The prototype of the C. was one of the earliest known forms of smoking, and its use was widespread among the natives of the Americas at the time of Columbus's voyages. The C. was adopted by the Sp. and Portuguese sailors, but although Eng. and other mariners were occasionally seen with crude rolls of tobacco leaf this method of smoking was, to all intents and purposes, confined in the W. world to the Iberian peninsula for almost 3 cents., probably owing to the almost universal acceptance of the pipe. The C. was

of the C., is rolled in a leaf known as the binder or bunch wrapper, which has to be made to the shape, size, and weight of the particular C. Finally this is covered with an outer leaf called the wrapper. The wrapper is the most expensive leaf used in C. manuf., and has to be sound and of good texture and colour. The binder need not have these qualities, and inferior grades and colours can be used, but it is preferable for it to be sound and of good size. Both wrapper and binder must have good steady burning qualities. For filler the small and broken leaves can be used. The shape, size, and colour of C.s



CIGARETTE-MAKING MACHINE

Imperial Tobacco Co.

brought to England as a result of the Peninsular war, and in spite of much criticism gradually ousted the snuff habit which was fashionable at that time. By 1840 the production of C.s in England was increasing rapidly. Leaf for the Brit. C. industry is obtained from the U.S.A. (particularly Wisconsin, Connecticut, and Pennsylvania), Brazil, Cuba, W. Canada, Jamaica, Brit. N. Borneo, Dominican Rep. (San Domingo), and the Dutch E. Indies.

C.s are produced by 3 methods: (a) entirely hand-made, which requires the greatest skill and is the most expensive; (b) the mould principle, where the bunches are shaped either by hand or machine, and pressed in wooden moulds, after which the outer wrapper is put on by hand; (c) entirely machine-made. These machines are composed of a bunch-making unit and a wrapping unit, and are manned by 2 operators. To make a C. the filler, which is the inside or the core

are indicated on the outside of the C. box. There are many shapes and sizes, and there is no hard and fast rule governing the choice of name to describe them, although certain names have become accepted by common usage. For instance Corona indicates a straight-shaped C. with a rounded top approximately $5\frac{1}{2}$ in. long, while a torpedo shape (i.e. a pointed C. drawn in at both ends) might be called Imperiale or Elegante. Panatella denotes a thin straight C. 5 in. to 6 in. long—the imported varieties being pointed while the Brit. product is usually open at both ends. Cheroots vary considerably in size, but are usually straight or very slightly tapered with both ends left open.

The colours or shades of C.s are denoted by the following markings: Claro, light; Colorado claro, medium light; Colorado, medium; Colorado maduro, medium dark; Maduro, dark.

Cigarette (dimin. of the word cigar),

small roll of fine-cut tobacco, usually wrapped in thin paper. C.s were popularised in England by soldiers returning from the Crimean War, and the first Eng. factory was set up at Walworth in 1856. C. smoking has increased steadily, particularly since the two world wars, and it now provides considerable revenue through heavy tobacco import duties. The most popular C.s in Great Britain are made from flue-cured Virginia type tobacco. This tobacco originated in the U.S.A., which still produces the finest types, and remains the main source of supply. In recent years Virginia type tobacco has been produced successfully in other countries, notably Canada, Rhodesia, and India. Turkish C.s are also manuf. in Great Britain, but their highly distinctive flavour is not generally popular in that country. The term Turkish is loosely applied to cover all oriental tobacco, i.e. tobaccos grown in the Near E., including Turkey, Greece, Cyprus, Syria, and the Balkans. Americans prefer blonded C.s, which are often sweetened with glycerine. Customs regulations in Great Britain forbid the treatment of C.s in this way. Contrary to widespread belief, saltpetre is never used during manuf. Considerable quantities of C.s are exported from Great Britain. C.s were originally made by hand, but hand-making is gradually dying out, having been superseded by modern high-speed machinery. There are two methods of hand-making—rolling by hand and push work, in which the tobacco is filled into a ready-made paper tube. Modern C.-making machines, having been fed with cut tobacco, bobbins, containing up to 3 m. of C. paper, printing ink, and paste, can produce perfect C.s at the rate of 1000 per min. The cut tobacco is fed into a narrow trough housing the C. paper, which runs in an endless stream from the bobbin. A printing device, incorporated in the machine, has meanwhile printed the maker's name and brand name, at C.-length intervals, on the paper. One edge having been gummed, the paper is curled round the tobacco and sealed to form one long C., which is cut into lengths by a rotating knife. Machines are also used for packing cartons and boxes, and electrical devices eject any packet containing an incorrect number of C.s. Many novelty types of C. have been produced—scented C.s, self-lighting C.s, and C.s in coloured papers—but none has attained popularity. The recent implication of C. smoking in the development of lung cancer is serious and has stimulated considerable research.

Cigliano, It. tn. in Piedmont (q.v.), 19 m. W. of Vercelli (q.v.). Pop. 6000.

Cignani, Carlo (1628–1719), It. painter, b. Bologna; a pupil of Battista Cairo and Francesco Albani, he derived his inspiration from Correggio. His best-known work is the 'Assumption of the Virgin,' at Forlì. Others are 'Entry of Paul III into Bologna'; 'Francis I touching for King's Evil'; 'Power of Love,' painted on the wall of the palace at Parma; and 'Adam and Eve,' at The Hague. His

son Felice (1660–1724) and nephew Paolo (1709–1764) were also painters.

Cignaroli, Giovanni Bettino (1706–70), It. painter, who in 1769 became director of the academy at Verona. He belonged to the late Venetian school.

Cigoli, Lodovico Cardi da (1559–1613), It. painter, architect, and poet, b. Cigoli, Tuscany. He was a pupil of Alessandro Allori (q.v.) and Santi di Tito, but he followed the great Florentine painters and especially Correggio, being known as the Florentine Correggio. His 'Ecce Homo,' which gained a prize against Passignani and Caravaggio, was taken to France by Napoleon, but restored to Florence in 1815. His paintings include 'St Peter healing the Lame Man,' in St Peter's at Rome; 'Conversion of St Paul,' in the church of San Paolo fuori le Mura; 'Story of Psyche,' in fresco at the Villa Borghese; and a 'Martyrdom of Stephen.'

Cilia are minute, fine-hair-like protoplasmic processes attached to one or both ends or the sides of some bacilli, by means of which they propel themselves. Bacilli possessing them are termed motile. Cells with C. attached also line some parts of many-celled animals. In man the epithelial cells lining some of the organs of the upper respiratory tract are ciliated.

Ciliata, div. of the Protozoa, which move and feed by means of cilia, and may possess undulating membranes near the mouth, membranellae and cilia. The body is nearly always surrounded by a thin layer of cuticle, contains many nuclei and sev. contractile vacuoles. Reproduction is by means of div. and by asexual process of conjugation.

Cilicia, classical and now obsolete name for region of Asiatic Turkey (q.v.), along the S. coast between Syria (q.v.) and Pamphylia (q.v.), which before the First World War was included in the Turkish vilayet of Adana (q.v.). In anct geography it included the valley of Adana and Tarsus, bounded by the Mediterranean on the S., Mt Taurus on the N., and Amanus on the E. It was part of the Persian Empire until Alexander's conquest, 331 bc. At his death it fell to Ptolemaic rule and later to the Seleucidae. The inhab. of the mountainous dists. became famous pirates. In 64 bc it was subdued by Pompey and made Rom. ter. It formed part of the Ottoman Empire in 1515. In 1833 it was ruled from Cairo, but was evacuated by Mehemet in 1840, and given back to the Turks. It is now included in the vilayet of Adana (Seyhan) in Turkish Asia Minor. Only ruins remain of its 2 great tns, Tarsus and Soli, once centres of Gk civilisation. By the treaty of Sévres (q.v.) part of C. was granted to France, but in 1921, after serious conflict with the Nationalist forces, France abandoned all claim to the dist. The products of the dist. include corn, wool, and sesame.

Cilician Gates, or Kilek Bogaz, narrow pass over the Taurus range in Asia Minor. The great highway led from the W., on a long rough descent from the central plateau, to the valley of Adana and Tarsus.

At the gates themselves the width of the road is 25 ft.

Cilli, *see* CELJE.

Cima, Giovanni Battista, called **Cima da Conegliano** (c. 1460-1518), Venetian painter, a pupil of Montagna (q.v.). His work resembles that of Giovanni Bellini (q.v.), whose studio foreman he is believed to have been. In various churches at Venice are to be found his 'Saint John the Baptist'; 'Saint James and Saint Nicholas'; and 'Saint Thomas touching the Wounds of Christ.' Other of his works are at Milan, Munich, and Dresden. In the Louvre is his 'Virgin and the Child Jesus,' and in the National Gallery, London, are a number of panels.

Cimabue, Giovanni (1210-c. 1302). It. painter, otherwise known as **Cenni di Pepo**, b. Florence. Little is known of his life but he worked in Rome, where he may have received his training, also at Pisa and Florence. Tradition credits him with being the greatest artist of his time, but much of the work attributed to him is not authenticated. According to Vasari he was the real founder of It. painting. This may be taken to imply that he was the first to break notably away from the rigid conventions of Byzantine art and to introduce a tendency towards naturalism. In the latter respect he was outshone by his pupil Giotto, whom he is supposed to have found as a child drawing on a slate with a piece of coal, and brought to Florence to teach. A famous painting attributed to him is a 'Madonna and Child with Angels,' which forms the altarpiece of the chapel of the Rucellai in Santa Maria Novella, Florence, but according to some this work has been proved to be by Duccio. Other Madonnas are to be found in the Academy of Arts at Florence and at the Louvre. He is also credited with some frescoes in the church of San Francesco, Pisa; his most famous work is a mosaic in the cathedral at Pisa, 'Christ in Glory between the Virgin and John the Evangelist.' He is buried in the cathedral at Florence. *See* T. Cole and W. J. Stillman, *Old Italian Masters*, 1892; Julia Cartwright (Mrs Ady), *Painters of Florence*, 1901; also G. Vasari, *Lives of the Painters* (Everyman's Library), 1927; Crowe and Cavalcaselle, *History of Painting in Italy*, 1923.

Cimarosa, Domenico (1749-1801). It. musical composer, b. Aversa. Naples. His first comic opera, *Le stravaganze del conte*, composed when he was 23, was a great success. He became the rival of Paisiello and wrote over 60 comic and serious operas. The most famous before his call to St Petersburg by Catherine II in 1787 were *L'italiana in Londra*, 1778, and the settings of Metastasio's *Alessandro nell'Indie*, 1781, and *L'Olimpiade*, 1784, the latter the most frequently set libretto. Only 2 works appeared during the stay in Russia, which ended when he was called to Vienna to succeed Salleri. It was there in 1792 that he produced his most famous work, *Il matrimonio segreto*, based on *The Clandestine Marriage* by Colman and Garrick. This is still performed, and *Le astuzie femminili*, 1794, was revived by

Diaghilev in 1920. C.'s last years were troubled by the revolution at Naples and he d. at Venice on the way to Russia for a second visit.

Cimbex, genus of hymenopterous insects in the sawfly family, Tenthredinidae. The species are often larger than bees, although most of the other members of the family are small and inconspicuous. The larvae are often very destructive to vegetable life, e.g. *C. americana*, which is known to destroy large elm-trees.

Cimbri, or **Kimbri**, Ger. tribe; Pliny writes of the peninsula of Jutland as the Cimbric Chersonese; Pomponius Mela that the C. and Teutones lived on the Sinus Codanus, i.e. the SW. corner of the Baltic. In Ptolemy's map Jutland is also marked as the Cimbric Chersonese. It was formerly thought that the C. were Celts (*Cymry*, the Welsh), but this view is not now held. At the end of the 2nd cent. bc they invaded Gaul, Illyria, and Italy. In 113 bc the Rom. consul Cn. Papirius Carbo was defeated by them at Norcia (Carinthia). They then moved W., and in 109 bc defeated the consul M. Junius Silanus in the S. of Gaul. In 105, led by their king Boiorix, they annihilated the Rom. Army under Cn. Mallius Maximus and Caepio at Arausio (Orange). Turning off towards Spain, they were driven back, and in 103 overran Gaul as far as the Seine, where the resistance of the Belgae forced them S. once more. With the Teutones they moved S. with the intention of invading Italy and conquering Rome. They divided their forces, the Teutones to take the W., the C. the E., passage of the Alps. At Aquae Sextiae (Aix), 18 m. N. of Marseilles, Caius Marius, the Rom. consul, inflicted a total and crushing defeat on the Teutones, 102 bc. The C. had passed the Alps to the E., and had forced the other Rom. army under Lutatius Catulus beyond the Adige and the Po. Marius followed up his victory over the Teutones by a still more crushing blow upon the C. on the Raundine plain, near Vercellae, annihilating their forces and killing Boiorix.

Cimbric Peninsula, *see* JUTLAND.

Cimicidae, small family of hemipterous insects, in the section Heteroptera, is represented in most lands where civilisation is predominant. The insects are parasitic on various vertebrates, such as men and birds, but are in turn preyed on by larger insects. The chief genus is *Cimex*, which contains few species, and none with which mankind would not gladly dispense. *Cimex lectularius* is the bed-bug. *See* Bug.

Cimicifuga, genus of ranunculaceous plants, consists of perennial herbs with divided leaves and racemes of whitish flowers; the roots act as drastic purgatives, and are poisonous.

Cimiez (ancient Civitas Cemenellensis), residential dist. of Nice (q.v.), France, in the N. of the tn. It has a Rom. arena, a notable church (partly Gothic), and fine hotels and villas. It was a favourite resort of Queen Victoria.

Ciminna, tn in Sicily (q.v.), 18 m. SE. of Palermo (q.v.). Pop. 6500.

Cimmerii, anct people mentioned by Homer as living on the banks of a stream in darkness and mist (*Odyssey*, xi. 14). An historical race of this name dwelt on the Palus Maeotis (Sea of Azov) and in Asiatic Sarmatia. Driven out by the Scythians, they passed into Asia Minor. About 657 BC they invaded Lydia, but were finally expelled by Alyattes (610-560 BC). Their identification with the Cimbr of Jutland rests upon no evidence other than similarity of name.

Cimolite, variety of clay (hydrous aluminium silicate), which is used as fuller's earth (q.v.), to absorb grease and oil from cloth. It is found in the is. of Argenteira, Greece, and has been mined from anct times.

Cimon (c. 507-449 BC), celebrated Athenian general, son of the great Miltiades and Hegesipylus. He distinguished himself by his valour in the Persian wars, and was, with Aristides, put in command of the Gk fleet sent to Asia against the Persians. He was later in sole command of the Gk naval forces, and conquered the isle of Seyros in 470 BC. He achieved a dual triumph in 468 or 467, defeating the Persian fleet off the R. Eurymedon in Pamphylia, and later in the same day winning a battle on the land. He was for some time one of the most prominent members of the aristocratic party in Athens; in pursuance of his policy of friendliness to Sparta, he led an Athenian force to aid them when the helots revolted in 462 BC. The Spartans, however, dismissed with scorn his proffered aid, and the Athenians in anger ostracised him in the following year on a pretext of corruption. He was recalled in 457 (or 451), and he defeated the Persians off the coast of Cyprus; the victory was due to him, but he d. before the engagement.

Cimpulung, tn of Rumania, 80 m. NW. of Bucharest, in the 13th cent. the first seat of the voivodes of Wallachia, and now an important spa. Pop. (1930) 13,900.

Cimpulung Moldovense, or Kimpulung, tn of Bukovina, Rumania, on the Moldava, situated about 55 m. SSW. of Chernovtsy. Pop. (1930) 10,000.

Cinchona, or **Peruvian Bark**, genus of Rubiaceae, consists of about 40 species of S. Amer. evergreen trees. They vary very much in size, have evergreen leaves, and flowers in panicles, white or pink in colour. The useful part of these trees is their bark, from which quinine is manuf., this medicine first being used by the Countess of Chinchon, wife of the ruler of Peru, to cure a fever, about the year 1638. After this it was taken to various places in Europe by the Jesuits, and obtained the name of Jesuits' bark. The work of obtaining the bark of these trees is carried on by Indians, who have to make their way through thick forests to the trees. The latter are detached from any vegetation growing round the stem, and after having been felled as near the root as possible, have their bark cut off from both the main stem and the branches. It is then dried and packed, the thinner bark of the branches curling up to form quills.

This method, however, was seen to be very expensive, and was leading to the extermination of the trees. Accordingly, plantations were tried in other parts, especially Algeria, Java, the Himalaya, and Ceylon. Cinchonidine, cinchonine, and other alkaloids are obtained from the bark in addition to quinine.

Cinchona Bark Alkaloids. The term alkaloid (q.v.) is applied to certain basic substances derived from plants and chemically related to pyridine, quinone, etc. They are generally of considerable physiological potency and many are valuable drugs. Sev. distinct members of the group have been obtained from C. H., the most important being *quinine*, $C_{20}H_{24}O_2N_2$, and *cinchonine*, $C_{15}H_{22}ON_2$, together with *quinidine*, an isomeride (see ISOMERISM) of quinine, and *cinchonidine*, an isomeride of cinchonine. Quinine, which is a specific for malaria and an excellent febrifuge, is a white crystalline solid melting at 177° C. It readily forms salts, e.g. quinine sulphate, and these salts are usually preferred in medicine to the alkaloid itself. Ammoniated tincture of quinine is a solution of quinine sulphate in a mixture of water and alcohol to which a little ammonia has been added. Cinchonine is very similar in constitution to quinine, but a solution of its sulphate does not show the characteristic fluorescence of quinine sulphate solutions. The structure of the C. B. A. has been solved only recently, and so far it has not been possible to make them synthetically. Similar compounds, however, such as mepacrin (Ger. Atebrin) have been artificially prepared in the laboratory.

Cinchonine ($C_{15}H_{22}ON_2$), alkaloid prepared from cinchona, the bark of certain trees grown in S. America and the E. and W. Indies. Cinchona contains 5 alkaloids, quinine, quinidine, C., cinchonidine, and conquinamine, of which C. and cinchonidine are isomeric. C. is similar to quinine in its effect upon the malaria parasite, but is not so active. It also has a tendency to produce convulsive movements in certain patients, which renders it advisable that quinine preparations should be free from C. C. is a colourless crystalline body, insoluble in water. The sulphate is dissolved with difficulty in pure water, but is soluble in acidulated water.

Cincinnati, second largest city of Ohio, U.S.A., on the N. bank of the Ohio R., 220 m. SW. of Cleveland. Five bridges connect it with Covington and Newport, Kentucky. It is an important riv. barge port. The low-lying, level land near the riv. is occupied by the commercial buildings. The residential part is on the hills. There are a number of fine buildings, of which perhaps the best is the Rom. Catholic cathedral of St Peter's, which contains the 'St Peter Delivered' by Murillo. Among other noteworthy examples of architecture are the U.S. gov. buildings, the Music Hall and Exposition Building, the Hamilton Co. Memorial Building, the Ohio Mechanics Institute, the city hall, the co. court-house, and the 40-storey skyscraper in Fountain Square.

The educational institutions include the Univ. of C., the Heb. Union College, Xavier Union, the College of Music, Ohio Mechanics Institute, and the Art Academy. Its cultural institutions also include the Conservatory of Music, the Art Museum, and the Taft Museum. Recreation is well provided for by 95 parks, of which the finest are Eden Park, to the E., and Burnet Woods to the N. There is a zoological garden. The public library contains 1,700,000 vols. C. is a commercial centre of the first rank, and its industries are varied and important. Among them may be mentioned the manuf. of machinery and machine tools, meat packing, soap, malt, liquors, clothing, clay products, and a large printing and publishing industry. It is a centre of the Amer. radio industry. It has airlines to Chicago, Detroit, etc. Eighteen railway lines meet here. Harriet Beecher Stowe lived here from 1832 to 1850, and many fugitive slaves were aided in C. homes in their flight to liberty. C. was founded in 1788. Fifty years later refugees from Prussia discovered that grapes grew abundantly in its vicinity, and it became a wine-producing centre, and later still it was nicknamed for a time Porkopolis. Since 1924 it has been governed by a city manager with a council of 9 elected by proportional representation. It is the only city in the world which, out of its own resources, built a railway system, the C. Southern, which has for long been leased by the municipality to one of the big trunk lines. The pop. in 1950 was 504,000 of whom nearly one-half are said to be of Ger. descent.

Cincinnatus, *Luotus Quinctius*, one of the earliest and most typical of the Rom. heroes, was b. about 519 bc. The legend runs that in 458 bc, when the Rom. Army had been cut off by the Aequi, he was called from his plough to become dictator. He overcame the enemy, and after serving the rep., returned to his farm. He was again made dictator in 439 bc.

Cinder-bed, name of a stratum of the Middle Purbeck series of the Jurassic system, so called by the quarrymen of the dist., and composed chiefly of the aggregated shells of an oyster.

Cinderford, tn of Glos., England, 13½ m. WSW. of Gloucester, in the Forest of Dean (q.v.), a mining, light industrial, and agric. centre. Pop. 7028.

Cineas, Thessalian, chief adviser and minister of Pyrrhus, King of Epirus. He studied oratory in Athens, and was known as the ablest and most eloquent man of his time. In 280 bc, after the defeat of the Romans at Heraclea, he was sent on a mission of peace to Rome. The terms were rejected through the agency of Appius Claudius Caecus, the censor, but on being sent again two years later, with easier terms, C. induced the Senate to accept his proposals of peace.

Cinematograph, apparatus for projecting on to a screen in rapid succession a series of images or pictures representing successive stages of appearances involving motion, thus producing the effect of a

continuously moving picture which accurately re-creates the normal movement of the people or objects photographed. The C. was the outcome of a cent. and more of experiment and invention. The principle on which it is based—the persistence of vision—had been described as early as the 2nd cent., and was demonstrated by Dr Peter Mark Roget in 1824. The first device to make use of the principle was the Thaumatrope, 1826, a disk of card with a design drawn on each face; when the disk was rapidly rotated the 2 designs seemed to be superimposed. In 1833 J. A. Plateau's Phenakistiscope first used the phenomenon to produce a moving image. Horner's Zoetrope, or Wheel of Life, 1834, was a variation of the Phenakistiscope. It consisted of a hollow cylinder with vertical slots at regular intervals around the sides. It revolved on a vertical axis, and pictures, arranged on strips, were placed round the inside. Viewed through the slots of the revolving cylinder, the pictures appeared to move. These devices, and Reynaud's Praxinoscope, 1877, the peak of their development, used drawn images; from 1851 onwards various attempts were made to produce photographic images for use in moving-picture machines. Means of taking photographs in rapid series—chronophotography—were developed in the 1870's and 1880's by a number of scientists, notably Muybridge (an Englishman) in America, Marey in France, and Anschütz in Germany. The most significant step in the development of motion pictures, however, was in 1889 when George Eastman put on the market strips of celluloid film for use in his 'Kodak' cameras. This at last gave both chronophotographers and motion-picture experimenters the material they had been lacking; and in the following year, while Marey achieved his first photographic series on flexible film, T. A. Edison and his assistant, W. K. L. Dickson, perfected their Kinetoscope. Basically this machine differed from the modern C. in only one respect—the moving picture was not projected on to a screen, but was viewed, by one person at a time, in a peep-show apparatus. The succeeding years saw a race to produce an efficient *projected* moving picture; the prin. competitors were Le Prince, Friese Greene, and his collaborators Mortimer Evans and F. H. Varley, Birt Acres, and R. W. Paul in England, Armat and Jenkins in America, Skladanovsky in Germany, and Georges Dumeny and the Lumière Brothers in France. To the Lumières must be conceded priority in giving the first performances to a paying public of projected, moving photographs; they first exhibited their Cinématographe at the Grand Café, Boulevard des Capucines, Paris, 28 Dec. 1895. The Lumières also gave the first public performances in this country, showing their Cinématographe at the Empire Theatre, Leicester Square, on 20 Feb. 1896. R. W. Paul followed with his Animatographe at the Alhambra a few days later.

C. negative film consists of sensitised emulsion mounted on a strip of celluloid

35 mm. wide. It is usually obtained in rolls of 1000 ft for use in cameras employed in studios, and in rolls of 2000 ft for use in portable cameras used on locations unrelated to studios. Studio cameras are electrically driven, whilst portable cameras are usually driven by clockwork or by electric batteries. All modern cameras, however, irrespective of size or type, are geared to run film at the rate of 24 pictures per sec. The film is driven from one spool through a gate behind the lens and on to a second spool. A positive

the corresponding sound track remain entirely separate, otherwise pictorial and sound adjustments could not be made. When an entire film has been finished, consisting of hundreds of separate strips of film, each presenting a different scene or a different angle of the same scene, and the corresponding sound track, the original negative, up till now untouched (for only the positive print is edited), is cut to match the finally edited film, and only when negative cutting has been completed is a combined print made, when, for



Paramount

CECIL B. DE MILLE DIRECTING 'SAMSON AND DELILAH'

print is then made. Such first prints from negatives are termed 'rushes,' and are viewed by the producer as soon as possible to check results. Professional productions are made on standard size film (35 mm.), whilst educational and amateur films are usually made on substandard size film—16 mm. and 9.5 mm. All C. films are now made on non-inflammable stock. Until the late twenties films were silent, their action and stories being generally explained by captions, and the cinema programme accompanied by an orchestra. With the birth of the talking film both the technique of production and the character of the cinema programme were revolutionised, for each film supplies its own dialogue or music (or both), thus making orchestral accompaniment unnecessary. Throughout the editing stage the picture film and

the first time, the sound track and the picture are printed on the same film. It is in this form that the film is projected in the cinema.

THE SCREEN. The once world-standard rectangular-shaped screen has now largely been superseded by wider screens, among which the best-known processes are the following:

Cinerama. Developed by Fred Waller, Cinerama was first shown publicly in New York on 30 Sept. 1952 (*This is Cinerama*). The film is 35 mm. wide and sprocketed, but all else about the system is special. Three cameras are used side by side, spanning a wide area. Projection is from 3 separate boxes and the 3 different images are accurately aligned on the screen to produce for viewers seated in the auditorium centre a picture of almost natural

human vision, that is presenting panoramic views. Seven sound tracks are on a separate 35-mm. film: 5 feed loudspeakers behind the deeply curved screen and the other 2 are connected to additional speakers to the left and right of the auditorium. Control of sound is by an engineer who also adjusts picture brightness and focus.

Cinemascope. This system of photography and projection was first used in New York on 16 Sept. 1953 (*The Robe*). The special lenses for camera and projector, based on earlier work by the Fr. physicist Dr Henri Chrétien, permit a picture almost twice as wide as that obtained with the conventional lens. The original Cinemascope had 4 sound tracks; 3 were fed into loudspeakers behind the screen to produce the stereophonic (or sound with depth) effect; the fourth fed a group of speakers about the auditorium for the surround effect. Normally on 35-mm. film; other processes have been produced on 55-mm. widths.

Vistavision. This name is given to sev. technical developments in the wider screen field. The main invention is a new type of camera and projector in which the film bears double images and moves horizontally from right to left through the machine when viewed by the operator from behind. The first public showing was in New York on 14 Oct. 1954 (*White Christmas*).

Superscope. Though photographed normally, Superscope is exposed approximately sprocket hole to sprocket hole instead of in the usual frame area. In colour horizontal compression is introduced into the matrix by Technicolor. In other printing methods compression can be done optically on to a dupe negative and printing carried out in the normal manner. Anamorphic lenses expand the image into normal shape during projection. A single photographic sound track is used in the usual place, and is accommodated by shifting the centre-line of the picture frame. A different sized aperture plate from the standard one is used.

Todd-AO. The newest wider screen process, Todd-AO, was first used publicly in New York on 12 Oct. 1955 (*Oklahoma!*). Projected on to a deeply curved wide screen, the process requires only 1 camera and 1 projector. Four camera lenses were developed (the widest being 120°) and are classified according to the angle of coverage. Film 65 mm. wide is used in the camera; with the 6 sound tracks (1 each side of the sprocket holes) the projection is 70 mm. wide.

In addition to wider screen processes, other developments in the technical field include:

Three-D. Third dimension or 'Three-D' is based upon the only system of truly stereoscopic motion pictures. It was widely publicised through the Brit. Film Institute's showing at the Festival of Britain Telekinema of the first polarised light system in which 3 or 4 documentaries made by Raymond Spottiswood were screened. These showings were eventually followed in the commercial cinema by

Arch Oboler's production *Bwana Devil*, which, because of its technical imperfections, did a great deal to retard progress of the third dimensional technique. Three-D is based on the fact that the 2 eyes look at objects from slightly different angles. The images projected upon the 2 retinas are therefore slightly different, but the visual mechanism in the brain combines them into a single three-dimensional impression. The 35-mm. stereo cameras used in Three-D pictures are essentially similar, as they take 2 pictures simultaneously which are identical in size and shape, and spaced apart horizontally. Natural Vision stereo cameras and some others have a fixed inter-axial distance between the 2 lenses of 2½ in.—the distance separating the human eyes. Other systems such as the Norling and the Stereo techniques employ devices to permit variable lens spacing and variable convergence. These 2 films are then projected from 2 projectors which are interlocked by either electrical or mechanical equipment to obtain exact synchronisation. However, it is essential that the right and left films reach only the right and left eyes respectively of the spectator in order that the brain may combine the 2 images into a stereoscopic impression. This is accomplished by the use of polarised light.

Dynamic Frame. During shooting, 2 sets of movable masks, which govern height and width of picture, are brought into play, and projection provides a constantly changing shape of picture, contracting or expanding whilst the film is on the screen. The first Dynamic Frame film (*The Door in the Wall*) was screened in 1956 in London and was produced by Glen Alroy under the auspices of the Brit. Film Institute Experimental Production Fund.

PRODUCTION AND DISTRIBUTION. The production of a feature film is carried out by a team of highly skilled technicians, grouped into different depts and co-ordinated by the director, who is responsible for the results. The chief technicians are the lighting cameraman, the recorder, the art director, and the editor, each aided by technical assistants. In control of a studio which may be making 3, 4, or more films simultaneously, each with its own director, is the producer, who is finally responsible to the company for all productions. Whereas each film is being made by a director, all the directors are responsible to the producer.

Films may be broadly divided into 2 main categories—features and shorts, most of the former being fictional and most of the latter being factual, covering documentary production and newsreels. There are 2 main channels through which films are exhibited: the *theatrical* or ordinary cinema exhibition for providing entertainment, and the *non-theatrical*, which covers the distribution and exhibition of films of an informative and instructional character to audiences unrelated to cinemas, as in clubs, institutes, factories, colleges. Non-theatrical shows are usually given on substandard size

film. The non-theatrical film show developed enormously during the Second World War in all countries, and the govts. of the belligerent nations organised regular propaganda film shows to keep their respective pops. informed on all vital matters. Brit. documentalists excel in the production of such short films, and the non-theatrical system of distribution has given them the opportunity, denied them by the double-feature cinema programme, of obtaining large audiences. Since 1945 non-theatrical showings have

HISTORY OF THE FILM AND FILM ACTING. Actuality films and topical events, filmed often from studio reconstructions, were the mainstay of the C. for public exhibition in its early days. Pioneer work in this direction is associated with the names of Léon Gaumont, Charles Pathé, and Georges Méliès in France, Edison, Edwin Porter, and Carl Laemmle in the U.S.A., and in Great Britain Cecil Hepworth, J. Williamson, R. W. Paul, and Bennett Stanford, who made films of the S. African war. Louis and Auguste



London Films

CHARLES LAUGHTON AS HENRY VIII IN A SCENE FROM
'THE PRIVATE LIFE OF HENRY VIII'

continued, and plans are laid for such films to play a permanent part in the gov.'s informational services. By this means special films are made for farmers, scientists, doctors, and students training for most professions and trades. Similarly the 16-mm. film is being employed increasingly for educational purposes in schools, and this visual method of teaching will, in due course, supersede many existing methods, for film is without equal for demonstrating and explaining processes, and bringing distant parts of the world to the classroom. The Brit. Film Institute serves as a link between the commercial film industry and the educational or non-theatrical film world, and records the hist. of the industry, possessing a library of all films which are important enough to preserve for future reference.

Lumière, inventors of the first projection machine, 1895, made films of scenes from home life, and in these members of their own families took part. Professional actors and actresses of the stage at first looked askance at the new medium. Dramas soon found a place on the screen; an early example was *The Life of Charles Peace*, made by the showman, Walter Haggart, in 1905. Historical dramas came into fashion. *Quo Vadis?*, 1913, an It. film, was a spectacular achievement which influenced the development of the feature film in America. Great stage celebrities began to make their appearance on the screen, Mlle Réjane in a film version of *Madame Sans-Gêne*, 1911, and Sarah Bernhardt in *Queen Elizabeth*, 1912, a film which the Amer. promoter Adolphe Zukor imported into America, and which helped

to estab. the feature film there. The film 'ramp' was created at this time by Madeleine Roch of the Comédie Française in *Femme Fatale*, 1912.

In the U.S.A. the 'star' system came into being as a result of the struggle for the control of the C. industry between a number of independent producers and a combined trust which was attempting to secure a monopoly of production and distribution. The independents, one of the chief among them being Carl Laemmle, sought to gain publicity by using the names and personalities of their actors and actresses. Thus Florence Lawrence became one of the first of the 'stars.' Until launched by Laemmle she had been known only anonymously as the 'Biograph girl' when working for the Biograph studio within the trust. Similarly 'Little Mary,' who had been discovered by D. W. Griffith in 1909 in *The Violin Maker of Cremona*, subsequently became famous as Mary Pickford. George Anderson, King Baggott, John Bunny, and Marguerite Snow were other actors who achieved early stardom at the hands of the independents. George Anderson in particular, known as 'Bronco Bill,' W. S. Hart, and Tom Mix, who had been a cowboy in Oklahoma before taking to films, became world famous for their cowboy films; and this type of film was thereafter to be an outstanding characteristic of the Amer. cinema.

It was in comedy that the film before the First World War had its most promising developments. France led the way, with the trick comedies of Méliès, and then with the comedians Dranem and Prince, the latter in the successful *Rigadin* the Clown series. A better-known figure was Max Linder, who began a tradition of screen comedy in which Charlie Chaplin also made his name. Chaplin's first film, *Making a Living*, was made for Keystone in 1914. He owed a good deal to the example of Mack Sennett, the hero of the celebrated Keystone comedies, as did other Keystone artists, Mabel Normand, 'Fatty' Arbuckle, Mack Swain, as well as later comedians such as Buster Keaton, Harold Lloyd, and W. C. Fields. It was while working for Keystone that Chaplin developed the character of the little man with the moustache and the baggy trousers who became world famous.

After the First World War the Amer. film industry enjoyed great prosperity. Hollywood attracted outstanding directors, actors, and actresses from Europe. Among them, besides Greta Garbo and Pola Negri, were Emil Jannings, Lars Hansen, and Conrad Veidt, who had made his name in the famous Ger. expressionist film *The Cabinet of Dr. Caligari*, directed by Robert Wiene in 1919, on the subject of insanity. Stardom in the U.S.A. was at its height. To the names already mentioned may be added those of Douglas Fairbanks, John Gilbert, Richard Dix, John Barrymore, Rudolph Valentino, and Adolphe Menjou. Menjou had been a success with Edna Purviance in *A Woman of Paris*, 1923, a film directed by Chaplin but in which he himself only made a brief

appearance. Edna Purviance also appeared with Chaplin in many of his early films. Rudolph Valentino became the idol of the 'fans' in *The Four Horsemen of the Apocalypse*, 1921, and *Monsieur Beaucaire*, 1924, the latter made by Sydney Olcott, a celebrated director since the nineties. Olcott was responsible for the spectacular *Ben Hur* in 1909. A film of the same title in 1928 became perhaps the most popular achievement of the silent film after the First World War. It made Ramon Novarro a star, the equal of



National Film Archives

A SCENE FROM 'THE FOUR HORSEMEN OF THE APOCALYPSE'

Valentino. Another eminent recruit to Hollywood from Europe was Ernst Lubitsch, who made his name in Germany in 1920 with the production of *Madame Du Barry*, entitled *Passion* in the U.S.A., and starring Pola Negri. His Amer. films begin with Mary Pickford in *Rosita*, 1923, Pola Negri in *Forbidden Paradise*, 1924, Emil Jannings in *The Patriot*, 1926, and continue well into the talkie era with the musical play *Monte Carlo*, 1930. Later films of his include *Bluebeard's Eighth Wife*, 1938, with Gary Cooper and Claudette Colbert, and *Ninotchka*, 1939, with Greta Garbo.

Outside the U.S.A. film production in the twenties was being developed, particularly in Germany, on ambitious, decorative, and highly dramatic lines, exemplified by *Siegfried* made by Fritz Lang in 1923. Russia was employing

film for propaganda purposes—to tell to her millions the story of the revolution. The early Russian silent films, *The Battleship Potemkin*, made by S. M. Eisenstein (q.v.) in 1925, and *The End of St Petersburg*, made in 1927 by V. I. Pudovkin, were unsurpassed, and made the fullest use of film to create powerful drama by the use of impressive camera angles and the skilful editing. In 1928 appeared Carl Dreyer's great work, *La Passion de Jeanne d'Arc*, regarded as one of the finest of the silent Fr. films, and in the same year the genius of René Clair (q.v.) was revealed in the whimsical comedy, *The Italian Straw Hat*. Excellent pioneer work in the documentary field had been done by the Amer. producer and explorer Robert Flaherty, who took the camera to the Eskimos for *Nanook of the North*, 1922, and to the S. Sea Islanders for *Moana*, 1926. He later contributed to the Brit. documentary movement with *Man of Aran*, 1934. Meanwhile, under Grierson's leadership, a number of Brit. directors as well as the Fr. director, Alberto Cavalcanti, were producing notable work with the G.P.O. Film Unit and other organisations.

The Russian cinema, controlled by the State, has continued to make excellent progress. One of its outstanding achievements has been the Gorki trilogy (*The Childhood of Maxim Gorki*, *My Universities*, *Out in the World*). Fr. films have won a special place by their naturalness, charm, and originality. René Clair's genius again revealed itself in *Sous les Toits de Paris*, 1930, followed by *A Nous la Liberté*, *Le Million*, and others. Other outstanding directors of Fr. films are Julien Duvivier (*Un Carnet de Bal*, *Pépé le Moko*), Jean Renoir (*La Grande Illusion*, *La Bête Humaine*), Marcel Pagnol (*La Femme du Rouvanger* and the Marias trilogy), Marcel Carné (*Le Quai des Brumes*, *Le Jour se Lève*, *Les Enfants du Paradis*), Jean Cocteau (*La Belle et la Bête*, *Les Enfants Terribles*, *Orphée*), H.-G. Clouzot (*The Wages of Fear*, *The Fiends*), and, in the comedy field, Jacques Tati (*Jour de Fête*, *Monsieur Hulot's Holiday*). It. films have shown a marked resurgence since the war, and the work of such directors as Roberto Rossellini (*Open City*, *Paisà*), Vittorio de Sica (*Shoe Shine*, *Bicycle Thieves*), and Luigi Zampa (*To Live in Peace*) has become known internationally. Ger. production suffered a setback during the Nazi regime, but there are signs that it will rediscover its original artistic approach to film-making. In both quantity and technical excellence, however, the U.S.A. continues to hold the field. For further details on the Amer. cinema see UNITED STATES OF AMERICA (FILM).

Brit. producers and directors who contributed to the improvement in production during and since the Second World War are, to mention only a few, Anthony Asquith (*The Way to the Stars*), Michael Powell (*The Life and Death of Colonel Blimp*, *A Matter of Life and Death*, and *The Edge of the World*), Sir Carol Reed (*Odd Man Out* and *The Third Man*), Sir

Laurence Olivier (*Henry V*, *Hamlet*, and *Richard III*), Gabriel Pascal (*Major Barbara* and *Caesar and Cleopatra*), and David Lean (*This Happy Breed*, *In Which We Serve*, *Great Expectations*, *Oliver Twist*, *Brief Encounter*, and *The Bridge on the River Kwai*). Mention must also be made of the comedies produced by Ealing Studios (*Passport to Pimlico*, *Kind Hearts and Coronets*, *Whisky Galore*, *The Lavender Hill Mob*, *The Man in the White Suit*, etc.). Latterly Jap. films have created a strong impression. The most important of those seen in Britain have been Akira Kurosawa's *Rashomon*, Kinugasa's *Gate of Hell*, and Kurosawa's *The Seven Samurai*. Important films have come from China and India, which produced Satyajit Ray's *Father Panchali*.

Perhaps the greatest individual success in film-making after Charles Chaplin's (q.v.) is that of Walt Disney (q.v.), whose feature-length cartoon films, beginning with *Snow White and the Seven Dwarfs* in 1938, and followed by *Pinocchio*, *Bambi*, and many others, pointed the way to a form of film-making which exerts a universal appeal.

A survey of films, however brief, would not be complete without mention of the opportunity for descriptive music given by the introduction of sound. Scores for films were contributed by such celebrated composers as Vaughan Williams (*Scott of the Antarctic*), Arnold Bax, Benjamin Britten, Wm Walton (*Henry V*, *Hamlet*, and *Richard III*), and Arthur Bliss, while others such as Richard Addinsell, Wm Alwyn, and Clifton Parker became known chiefly for their work for films. Among film music directors mention must be made of Bretton Byrd, who was associated with the outstanding Brit. comedy films of the thirties, also John Hollingsworth, Charles Williams, and in particular Muir Mathieson, who has appeared in films with the London Symphony Orchestra.

Films as an aid to scientific research. The cine-camera is of great use in research work. It can act as a time-expander, recording with an 'unblinking eye' intimate details of a process which lasts for a thousandth of a second or even less, and it can spread out its record to show for minutes or hours events that lasted only a few seconds. Conversely it can be used equally well as a time compressor when pictures taken once every hour are projected as a continuous film, compressing the events of days into a few minutes. The cine-camera can—as in X-ray cinematography—do the same kind of things for the otherwise invisible, giving us, for example, a motion record of events within the animal body which cannot be seen in any other way. Through the cine-film astronomers have known for many years that large masses of incandescent matter are shot out of the sun and can be seen as solar prominences at the time of a total eclipse. Again, the technique of photographing a phenomenon at spaced-out intervals and projecting the film at the usual speed has been applied by the chemist and the metallurgist to the study of the growth of crystals. Hundreds of

motions in industry and in the laboratory have been studied with the same technique as that used in the slow-motion films of athletes and race-horses. The value of such films lies in the exactness with which it is possible to take measurements of events too fast to see with the human eye.

In 1956 the estimated amount of money invested in the Amer. motion-picture industry was \$2,738,700,000. In the same year there were 35,000 cinemas in U.S.S.R., 19,003 in the U.S.A., 7000 in W. Germany, 6611 in S. America, 5690 (about 5100 of which were efficient) in France, 4500 in Spain, 4325 in Great Britain, 3500 in Czechoslovakia, 2583 (in 1955) in Sweden, 1600 in E. Germany, 1582 in Belgium, 540 in Switzerland, 528 in the Netherlands, and 500 in Denmark.

See also CENSORSHIP, FILM; CHRONOCHROME; TECHNICOLOR; UNITED STATES OF AMERICA (FILM); and entries under individual stars and directors.

See J. R. Cameron, *Motion Pictures with Sound*, 1929; R. Arnheim, *Film*, 1933; M. Bardèche and R. Brasillach, *Histoire du Cinéma*, 1935 (Eng. trans. 1938); R. Spottiswoode, *A Grammar of Film*, 1935; P. Rotha, *Documentary Film*, 1936, and *The Film Till Now*, 1950; A. Buchanan, *Film Making from Script to Screen*, 1937; L. Jacobs, *The Rise of the American Film*, New York, 1939; F. Hardy (ed.), *Grierson on Documentary*, 1946; J. P. Mayer, *Sociology of Film*, 1946; J. Huntley, *British Film Music*, 1947; M. Balcon and others, *Twenty Years of British Film*, 1947; E. Lindgren, *The Art of the Film*, 1948; R. Low and R. Manvell, *The History of the British Film, 1896-1906, 1906-1914, 1914-1918, 1948-1950*; R. Manvell, *The Film and the Public*, 1955; and the ann. *International Motion Picture Almanac*, New York.

Cineraria: 1. Genus of African shrubs or herbs, family Compositae, about 25 species; grown under glass in Britain.

2. Flower of the garden or florist which is used for greenhouse or indoor decoration in winter and spring, derived from *Senecio cruentus*, and now existing in sev. forms and strains.

Cinerary Urns, hand-made vessels of clay, glass, or sculptured marble, in which the ashes of those who had been cremated were preserved. They are relics of the Stone and Bronze ages of N. Europe, while others of a widely different type are found in Rom. tombs. The urn proper used for containing the ashes is a large flower-pot-shaped vessel, and decorated only on the top; but other urns used were the food-vessel variety, rather broad in shape, and standing low; the drinking-cup variety, tall and slim, with beautiful decorative designs covering the whole surface; and a vessel shaped like a cone, decorated, and having 2 or 3 perforations through the periphery, and known as incense cups. These latter were probably used to contain the fire with which the funeral pyre was lighted.

Cingoli (anct Cingulum), It. tn in the Marches (q.v.), 13 m. NW. of Macerata (q.v.). Pop. 3000.

Cinna, Gaius Helvius, Rom. poet; tribune in 44 B.C. He was author of an epic poem entitled *Smyrna*, the composition of which, according to Plutarch, took him 8 years. After the funeral of Caesar he was mistaken by the mob for L. Cornelius C., one of the assassins, and lynched.

Cinna, Lucius Cornelius, Rom. statesman and member of the popular party. In 87 B.C. his election to the consulship was allowed by Sulla on condition of his taking an oath not to alter the existing constitution. On Sulla's departure for the E. soon afterwards C. violated his oath; riots ensued, and he was expelled from the city. Together with Marius he returned at the head of an army, captured Rome, and was consul for 3 successive years (86-84 B.C.). Proscriptions followed, and the death of Marius in Jan. 86 left C. leader of the popular party. Receiving news of Sulla's imminent return in 84, C. prepared to resist him, but was murdered by his own troops.

Cinnabar, prin. ore of mercury, is the sulphide HgS. It crystallises in small rhombohedral crystals with an adamantine lustre. The usual method of obtaining mercury from the ore is by roasting the ore when the sulphur is oxidised off into sulphur dioxide, and the mercury distils off and is condensed in a series of flues or chambers. It is found in Almaden in Spain, California, the Bavarian Palatinate, and Idria in Calabria.

Cinnamic Acid (C₉H₇.CH.CO.OH), or **Phenylacrylic Acid**, constituent of storax (*Syrax officinalis*), from which it may be extracted by warming the resin with caustic soda. C. A. is a crystalline solid melting at 133° C.

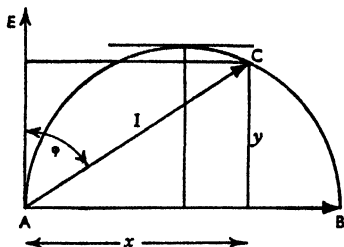
Cinnamomum, important genus of Lauraceae, confined to the E. Indies. There are over 100 species, many of which yield either cinnamon or cassia, 2 aromatic barks. *C. zeylanicum* produces the finest cinnamon, and is cultivated in Ceylon; *C. Cassia* produces cassia, and is often used to adulterate cinnamon; *C. Camphora* is the plant from which camphor is distilled. See separate articles for various products.

Cinnamon, bark of the twigs of a small tree, *Cinnamomum zeylanicum*, family Lauraceae. The bark is taken off, and when dry curls up. It is the oil of C. which produces its flavour, and this is prepared from pieces of bark which are first soaked in sea water and then distilled. The oil itself is of a yellowish-brown colour. C. is useful both as a medicine and as a flavouring in cooking. Cassia, which is produced from another variety of the genus, is sometimes used instead of C., but is much coarser. (See illustration, p. 482.)

Cinnamon Stone, or **Hessonite**, variety of garnet so called on account of its resembling cinnamon in its yellowish-brown colour. It is found in Scotland, Ireland, Ceylon, and the U.S.A., sometimes occurring in shapeless masses and sometimes in the form of crystals. The variety found in Ceylon is used in jewellery work.

Cino da Pistoia (c. 1268-1337), It. poet,

$R = 0$, the current I represented by AB is maximum. $= E/X$, lagging the voltage E by 90° . As R increases, the impedance $Z = \sqrt{R^2 + X^2}$ increases, the current and phase angle (ϕ) decrease. If x, y are the



co-ordinates to the endpoint of the current vector AC of length I at any intermediate position, $x = I \sin \phi = \frac{E}{Z} \cdot \frac{X}{Z}$, $y = I \cos \phi = \frac{E}{Z} \cdot \frac{R}{Z}$ and $x^2 + y^2 = I^2 = \frac{E^2}{Z^2} = \frac{E^2}{R^2 + X^2}$.

This is the equation to a circle on E/X as diameter, described by the current vector as the resistance goes from 0 to ∞ . The power $EI \cos \phi$ is measured by the ordinate y . It is maximum for $\phi = 45^\circ$, $R = X$. In a more developed form the C. D. represents the working of the alternating current induction and commutator motors. See CIRCUIT, ELECTRIC.

'Circle News,' see ARMY NEWS SERVICES. Circle of Confusion, in photography (q.v.), the degree to which a geometrical point of light is diffused in the image projected by a lens. For reasonable sharpness the disk diameter may be $\frac{1}{100}$ in. when viewing a print or enlargement at about 10 in. from the eye; from this it will be seen that the disk must be much smaller in negatives which are to be greatly enlarged.

Circle of Curvature, see RADIUS OF CURVATURE.

Circles of Stone, see STONE CIRCLES.

Circuit, Electric, any combination of resistances and reactances carrying direct or alternating current. In direct current C.s the reactance is zero and voltage/current relations are determined by the simple form of Ohm's Law (q.v.); the volt drop across a resistance R is $R \times$ current. When resistances $R_1, R_2, R_3 \dots$ are joined in series the current I is constant through the circuit and the total voltage is $E = R_1 I + R_2 I + R_3 I \dots$ the total resistance being $R_1 + R_2 + R_3 + \dots$. If the resistances are joined in parallel across a voltage E , the currents in the branches are $I_1 = E/R_1, I_2 = E/R_2, I_3 = E/R_3 \dots$ the total current is $I_1 + I_2 + I_3 + \dots = E \left\{ \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots \right\}$ and the resistance of the branches taken together is given by $\frac{1}{R} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots$. In alternating current C.s the addition of current and

voltage values, being varying quantities assumed to follow sine curves, is a geometric ('vector') addition (see ALTERNATING CURRENT). The sum of the sine curves (q.v.) represented by OA and OB is the sine curve represented by OC . The

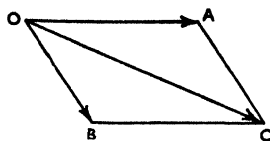


FIG. 1

voltage across a pure ('ohmic') resistance R carrying a current $I \sin \omega t$ is $RI \sin \omega t$, in phase with the current. The voltage across an inductance L is $L \times$ (rate of change of current). The rate of change of $\sin \omega t$ is $\omega \cos \omega t$, thus the voltage across L is $\omega L \cos \omega t$, leading the current

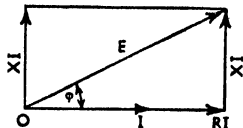


FIG. 2

by 90° . The quantity $\omega L = X$ is the reactance. The magnitude of the resultant voltage is $I \sqrt{R^2 + X^2}$, the quantity $\sqrt{R^2 + X^2} = Z$ is the impedance = the ratio of the magnitudes (peak values or r.m.s. values) of voltage to current. The voltage leads the current by a phase angle ϕ , $\tan \phi = X/R$ (the Q-factor), $\cos \phi = R/Z$ (the power factor). Adopting the prefix j to indicate a vector turned anticlockwise by 90° , $E = RI + jXI$ or $Z = R + jX$. The common induction coil has both resistance and inductance and is equivalent to a C. with resistance in series with inductance. A C. consisting of a number of induction coils in series, with resistances $R_1, R_2, R_3 \dots$ and reactances $X_1, X_2, X_3 \dots$ has impedance $Z = (R_1 + R_2 + R_3 \dots) + j(X_1 + X_2 \dots)$ and the voltage across the C. is the geometric sum of the voltages across each coil, also obtained by adding all in-phase components and all leading components. The admittance, Y , the ratio of current to voltage, is the inverse of impedance, $Y = \frac{1}{R + jX}$. As the meaning of the prefix j in the denominator is not clear, we write $Y = \frac{1}{R - jX} = \frac{R + jX}{(R - jX)(R + jX)} = \frac{R + jX}{R^2 + (-j)(+j)X^2} = \frac{R + jX}{R^2 + X^2}$ ($+j)(-j)$ indicates turning a vector $+90^\circ$ and then turning it back -90° : the result is unity. Thus $Y = \frac{R}{Z^2} - j\frac{X}{Z^2} = G - jB$. G is called the conductance, B the susceptance. It is easy to verify that $(R +$

jX ($G - jB$) = 1. If sev. induction coils are connected in parallel across a voltage E , the branch currents are $F_1E, Y_2E \dots$ and the resultant current is the sum ($G_1 + G_2 + G_3 \dots$) $E - j(B_1 + B_2 + B_3 \dots)E$. In a capacitor of capacitance C with a voltage $E \sin \omega t$ across the plates, the charge at any instant is $q = CE \sin \omega t$, the current is the rate of change of q , $\omega CE \cos \omega t$, leading the voltage by 90° . In a C. with a resistance R in series with a capacitance C , carrying a current $I \sin \omega t$, the voltage has a component $IR \sin \omega t$ in phase and a component $I/\omega C$ lagging by 90° , the impedance $Z = R - j\frac{1}{\omega C}$. If an inductance L is inserted, the total reactance becomes $\omega L - \frac{1}{\omega C}$. The voltages

across the inductance and the capacitance are opposite in phase. If now L or C is adjusted so that $\omega L = 1/\omega C$, the reactance vanishes and the current is limited by the resistance only. The C. gives 'maximum response' to any applied voltage—this is the condition of resonance. If the frequency $f = \frac{\omega}{2\pi}$ is varied, the value

$f = \frac{1}{2\pi\sqrt{LC}}$ will give resonance. This is the 'proper' or resonance frequency of the C. Adjusting either L or C to resonance is 'tuning' the C. It should be noted that it is assumed throughout that L is independent of the value of the current, which only holds for air-cored inductance. An iron core introduces complications due to the fact that the magnetic induction B is not proportional to magnetising force H , and leads to the complex phenomenon of 'ferro-resonance.' It is also important to note that inductive reactance is directly proportional to frequency, capacitive reactance is inversely so. On low frequencies the inductance is of little effect on the current, but a capacitance is more like an open C.; on very high frequencies the inductance has an open-circuit effect, the capacitance nearly a short-circuit effect. The inductance bars or 'chokes' high frequency currents, the capacitance chokes low frequency currents and definitely bars direct current. See E. W. Golding, *Electrical Measurements and Measuring Instruments*, 1940; A. E. Clayton, *Alternating Currents*, 1934; A. T. Dover, *Theory and Practice of Alternating Currents*, 1944; J. R. Barr and D. J. Bolton, *Principles of Direct-Current Electrical Engineering*, 1943.

Circuit-breaker, powerful switch which opens a circuit automatically in conditions which endanger the plant or network, such as excessive current (short circuit) or voltage or failure of generating plant. The C.s are usually operated by relays. In some cases the fault is of short duration and is cleared as soon as the C. is opened. To avoid interruption of supply to consumers, C.s are often made 'rapid-reclosing,' closing the circuit after a fraction of a sec. Should the fault persist, the C. opens again. Sometimes this process is repeated. Arcing between

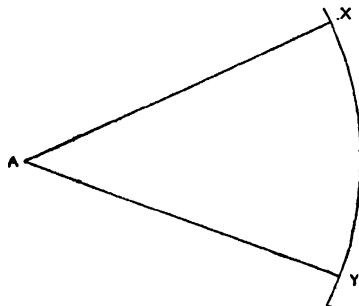
contacts may be minimised by immersion in oil or by air blast. The size of C.s is indicated by their rupturing capacity in kVA, i.e. the volt-amperes they can open successfully. C.s on the high voltage network of the Grid have a rupturing capacity of $1\frac{1}{2}$ million kVA.

Circuits, periodical progresses of the judges of the queen's bench div. of the high court of justice through the sev. cos. of England and Wales, for the purpose of administering justice in civil and criminal matters. The circuit system dates almost from the reign of Henry I, who organised C. of the judges of the *curia regis* and barons of the exchequer partly for judicial, but principally for financial, purposes. The great function of these old itinerant justices was that they linked up the local with the central administration. In 1173 the country was divided into 6 C. for exchequer purposes. The judicial functions were further developed by commissions of justices to try criminals presented by the hundred and the shire. Edward I replaced the irregular C. of the itinerants by regular C. of the judges of assize; the country being divided into 4 C. In 1293, with 2 judges to each div. The present assizes may be said to date from the close of the 13th cent., when the judges of assize were empowered to act under commissions of *nisi prius* (q.v.), oyer and terminer (q.v.), and jail delivery (q.v.). Regulation of the present C. was originally provided for by the Judicature Act, 1875, but this is now replaced by the Supreme Court of Judicature (Consolidation) Act, 1925. At the present day the C. comprise 8 divs.: the SE., Midland, N., NE., Oxford, W., N. Wales and Chester, and S. Wales. The winter assizes commence about the middle of Jan.; the summer, the middle of May; and the autumn, the middle of Oct. No civil (*nisi prius*) business is taken at the autumn assizes except in Bristol, Devon, Glamorgan, Lanarkshire, and Suffolk. There are additional assizes in May for Lancs and Yorks. In the U.S.A. there are 9 federal circuit courts of appeal, each circuit having appellate jurisdiction over sev. federal dist. courts. The President appoints the judges to these circuit courts, but judges of the dist. courts are eligible to sit. These courts have appellate jurisdiction over most of the issues cognisable by the dist. courts, though some issues go direct to the supreme court. See also ASSIZE.

Circular Measure, in geometry, a method of measuring angles. The angle between 2 straight intersecting lines, AX and AY, is expressed as the ratio of the length of the circular arc XY to the length of the radius AY of the circle; in general, angle

$$= \frac{\text{length of arc}}{\text{radius}}$$
 This expression is independent of the length of the given radius, since, for a given angle, the length of the arc is proportional to the radius. The unit of C. M. is the *radian*, the angle subtended at the centre of the circle by an arc of length equal to the radius. Since the length of the circumference of a

circle = $2\pi \times$ radius, the number of radians in a full circle is 2π , i.e. approximately 6.284. In order to convert the measure of an angle from degrees to radians, multiply by $\frac{2\pi}{360}$ or divide by 57.296. See also METROLOGY.



Circular Note, see CREDIT, LETTER OF.
Circular Numbers, any number with 1, 5, or 6 in the units place.

Circulating Libraries, as opposed to public libraries (q.v.), are those for the use of which a subscription is charged. They were first introduced into England in the 1740's by a bookseller who charged a fee for the loan of books from his shop. By 1776 4 C. L. existed in London, and in 1842 Mudie (q.v.) founded his famous library, which to a great extent determined the reading taste of the day. The library of W. H. Smith (q.v.) was estab. in the late 19th cent. and the Times Book Club in the early 20th cent., and there are large C. L. at Foyles, Harrods, Army and Navy Stores, and Boots (at most branches). A number of 'twopenny libraries' sprang up at the beginning of the cent., but they are largely superseded by the public libraries.

Circulation of the Blood. Harvey in 1628 was the first to demonstrate that the blood circulates. The ancients had conceived that the arteries held air, and it was generally held prior to Harvey that the blood was pumped from the heart to the veins, and that the blood moved in a to-and-fro movement. He, however, showed that the veins have valves which prevent the blood flowing back, and at the same time he proved that the arteries contained blood, not air. The circulatory system consists of arteries, veins, capillaries, and the heart. The arteries are tubes, with stout elastic walls well provided with muscular tissue. They branch in their course, becoming thinner-walled and smaller as they subdivide, and finally they pass into the capillaries, which are very minute and walled only with a single layer of cells. These capillaries run through the tissues and unite to form small veins, or venules, and these in their turn unite to form the large veins. As has been pointed out, these veins often possess valves which prevent a reflux of

blood into the arteries. The heart (q.v.) is a 4-chambered muscular bag, which by its alternate contraction and dilation acts as the pump which maintains the circulation through the body. These 4 chambers are divided into pairs, the right and left ventricles, and the right and left auricles. The auricles are in communication with the ventricles, but the right chambers of the heart are only connected to the left in the indirect manner shown in the description of the circulation. The vessels which lead from the ventricles are respectively termed the pulmonary artery on the right and the aorta on the left. There are valves between the auricles and the ventricles, that on the right side consisting of 3 flaps and being termed the tricuspid, that on the left being termed mitral, or bicuspid, and consisting only of 2 flaps. In order that the blood may circulate through the body it has to describe 2 circles. It has to pass through the body generally in a large circle, and this is called the systemic circulation, while it further has to pass through the lungs, forming the pulmonary circulation. The 2 auricles of the heart contract and drive the blood into the still expanded ventricles. Thereupon the auricles relax and the ventricles contract, driving the blood through the aorta and the pulmonary arteries. This alternate contracting and expanding causes a continual flow of blood in a series of spurts (the pulse beats). The blood driven into the pulmonary artery passes through it into its 2 branches, one branch passing through each lung. Here the blood is oxygenated and purified, since it is passed through smaller and smaller branches, ultimately directed into the pulmonary capillaries covering the air cells of the lungs (q.v.). Here the carbon dioxide is given up and oxygen taken. These capillaries then reunite into 4 pulmonary veins which carry the blood to the left auricle. Oxygenated as it now is, it is in a similar manner passed again into the left ventricle, and from thence into the aorta, which carries it in a great curve down alongside the vertebral column. Branches are given off from this for the head, the neck, and the arms at the curve, while on its downward course it throws branches to the thorax, abdomen, and legs. From the various branches of the aorta the blood passes into the capillaries, and is again gathered up into the veins after it has parted with its oxygen to the tissues and gathered up the carbon dioxide gas which represents the waste. These veins unite into 2 large trunks, the superior and inferior venae cavae. The superior vena cava receives the blood from the head, neck, and arms, while the inferior vena cava receives the blood from the rest of the body. Through these the blood is poured back again into the right auricle, whence it repeats the above process, being reoxygenated each time on circulating through the pulmonary system before it begins its course through the general system. The blood of the abdominal viscera, however, takes a different course. It comes from the aorta, but from the capillaries of the stomach,

intestines, and spleen, it is gathered into the portal vein. From here it passes into the liver, where again it is distributed into capillaries. At the same time blood travels direct from the aorta to the liver by means of the hepatic artery. It is through the portal vein that many of the products of digestion are carried to the liver, mingling with the blood from the hepatic artery, and the capillaries reuniting to form small veins; these again join together to form the hepatic vein, which carries the blood back into the

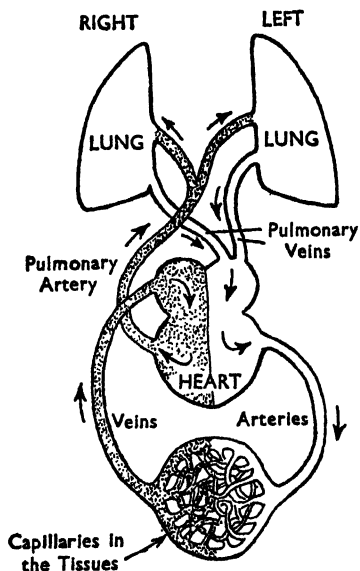


DIAGRAM OF THE CIRCULATION OF THE BLOOD

inferior vena cava. This course taken by the blood from the abdominal viscera, through the liver to the hepatic vein, involving a passage through the 2 sets of capillaries, is referred to as the portal circulation (see LYMPH). The heart itself receives its supply of blood from what are termed coronary arteries which spring from the root of the aorta. This blood, after passing through the heart capillaries, is passed directly into the right auricle. The disease angina pectoris is caused by a partial blocking of these coronary arteries.

Comparative. It is not until we come to the higher worms that we arrive at anything approaching a vascular system, the various types giving rise to manifold stages until the highest stage for them is reached in the possession of a dorsal heart. In crustaceans, arteries are fairly well developed through which the blood

is driven from this dorsal heart. The venous system is lacunar, the venous blood passing along body cavity spaces to the gills and thence back to the heart. In insects the vascular system is not very distinctly developed. In molluscs the arterial system is fairly well developed. Passing to the vertebrates, the heart is a ventral and not a dorsal vessel. The typical fish circulation involves the fact that the heart always contains deoxygenated blood, which is taken by the afferent branchials to the gills, where it absorbs oxygen. The dorsal aorta, formed from efferent branchials which drain the gills, carries the blood to the body; thus showing the great difference between them and the higher vertebrates, in whom the dorsal aorta arises from the heart. Moreover in fish the blood travels along a single circuit, in contrast to the double circulation of higher vertebrates. In amphibians the heart has developed into a 3-chambered organ. They have a right and left auricle and 1 ventricle; the ventricle drives the blood to the head, body, and lungs, while the right auricle takes deoxygenated blood from the body, and the left oxygenated blood from the lungs or gills. In all these stages oxygenated and deoxygenated blood is more or less mixed, and it is only in birds and mammals that there is a complete separation of the 2 sides of the heart, resulting in the separation of the arterial and venous systems, so that they can only communicate through capillaries. In birds the aorta goes to the right, while in mammals it goes to the left, but except for the fact that their hearts are different in structure, and for the above fact, the circulatory systems are similar in birds and mammals. In this matter the metamorphosis of the frog affords a striking example of the evolution of the circulatory system from the fish-like arrangement of the tadpole to the circulation of the adult frog as described above. See W. Harvey, *De Motu Cordis et Sanguinis*, 1628 (Eng. trans., *The Circulation of the Blood*, No. 262 in Everyman's Library); C. Singer, *The Discovery of the Circulation of the Blood*, 1922; H. Gray, *Anatomy* (31st ed.), 1954.

Circumcision (Lat. cutting round), cutting off of the foreskin (prepuce), is a rite of ancient origin and widespread use. It was practised among the early Egyptians, as is proved by extant monuments; and it is a primitive Arab custom. It was practised by the Aztecs, and at the present time by all Muslims, the Kaffirs, the Australian aborigines, the Papuans, and the Jews. The last-named people regard it, as they have always done, as a custom of great religious importance; and one of the earliest controversies of the Christian Church was on the subject of its retention. The reason for the rite is not known, but it originated probably either as a sacrifice or as a distinctive tribal mark, like tattooing. C. is also practised on purely medical grounds in cases where the foreskin cannot be drawn back to allow cleansing of the underlying parts, or when the opening of the prepuce is so small as

to obstruct the flow of urine. It is a trivial operation in infancy.

Circumcision, Feast of the, commemorates on 1 Jan. the Circumcision of Jesus Christ 8 days after his birth, according to the Law of Moses.

Circumference (Lat. *circum*, round; *ferre*, to carry), or periphery, is the name given to the curved line which encloses a plane geometrical figure, such as a circle, an ellipse, etc. See **CIRCLE**.

Circumferentor, instrument used in surveying of mines. It consists of a compass, with diametrical sights, the dial of which is divided into degrees. This is attached to a stand, and can be adjusted so that the angle which the line of sight makes with the magnetic N. can be observed on the dial.

Circumlocution, see **PERIPHRAISIS**.

Circumnavigation means literally sailing around, but is usually applied to voyages round the world. Among famous circumnavigators may be mentioned Francis Drake, Bougainville (1766-9), and Capt. Cook (1776-9).

Circumpolar Stars, see **STARS**.

Circumstantial Evidence, see **EVIDENCE**.

Circumvallation. In fortification, an entrenchment or chain of defensive works, erected by a besieging army, but facing outwards towards the country, so as to guard against attempts at relief by a field army, is called a line of C. The field-works are sometimes connected by a parapet or a rampart.

Circus (Lat. *circus*, Gk *Kirkos* or *Krikos*), very ancient form of entertainment, originally an exhibition of athletic prowess in the form of races and contests of various kinds. The Rom. C. was held in the open air in vast buildings which have their modern equivalent in the sports stadiums, which are almost always of the same elliptical shape. The seating, then as now, was in tiers, and in Rom. days the lower tiers were of wood and the upper of stone, the lower seats being reserved for the aristocracy. There were boxes for great personages. Chariot racing was one of the most popular contests in the Rom. C., the horses being driven by expert charioteers, nearly always slaves, who drove 2, 3, 4, and sometimes more horses. Contestants wore distinctive colours. Immense excitement was aroused and accidents were many.

The modern C. dates from the middle of the 18th cent. Except that it was performed in an arena, it had little in common with the Rom. C., except in the use of horses. It was entirely a professional affair. It was a travelling entertainment, touring the country and given in a tent. Performing animals of all kinds played a large part in it, but equestrian skill was the big attraction. There was a comic element introduced by the clown. Philip Astley (q.v.), a very notable horseman, was the first to found a C. which had a fixed abode (on the S. side of Westminster Bridge, London). At first only the seats were roofed over, the ring itself being open to the sky. He introduced many varied acts, including singing and dancing. He had opposition from the Royal C., which

opened in 1783 and afterwards became the Surrey Theatre. Astley scored big successes with his troops of trained horses which performed tricks at the word of command, and these 'liberty horses' are still one of the most popular acts in any C. (The training of such animals, not only horses but all sorts of beasts, including seals, has now reached a high point of perfection. In no case, whether with lions, tigers, horses, or any form of animal life, is cruelty used. It is impossible to teach animals by that means.) Many others followed Astley's lead, notably Ducrow. From the C. proper arose the equine drama, full-blooded and spectacular melodramas, often of a patriotic nature, in which many horses and other animals were used. The famous 'Maz-eppa' was an outstanding example of this rather curious form of dramatic art, which became so popular that it invaded the Theatre Royal, Drury Lane, itself. Lion-taming became an important part of C. programmes and there have been many famous exponents of this difficult and at times dangerous calling, one of the earliest celebrities being a Dutchman named Van Ambergh or Amburgh, whose performances at Drury Lane Queen Victoria visited 4 times in 1 month. London and other cities had resident C.s for many years. Henglers, which stood on the site now occupied by the London Palladium, was outstanding. Here too horses played a large part, and the programme usually ended with a water show, the ring being inundated with water. The London Hippodrome, as its name implies, was originally used mostly as a C., although, like Astley's Amphitheatre in its later days, it had a stage as well. But the C. never entirely deserted 'the round' and many spent all the summer touring round the country. For many years 'Lord' George Sanger's C. was the greatest in Great Britain. Mr Sanger (q.v.) was not a peer; 'Lord' was an assumed title. An outstanding success at the Agric. Hall, Islington, started his C. on its career. For many years that hall staged a C. every Christmas as part of a vast show called 'The World's Fair,' but Sanger's C. was in the main a road show. Nor must Wullf's C. be forgotten. This was a most elaborate affair and for many years was to be seen every Christmas at the Crystal Palace. It always ended with a spectacular production, such as a tournament with knights in armour jousting, or a wild boar hunt. Simple but most effective scenic tricks were used and the costumes were elaborate. Sanger, too, did not disdain a spectacular ending to his C., which frequently took the form of his version of a famous battle, in which fire-works played a prominent part.

The lure of the C. ring has attracted many and does so to-day. The tan and the sawdust, the spangles and the high efficiency of the performers, people who lived a life apart and were never seen out of the ring, touched a note of romance. This was soon found to be non-existent by those who risked all to join a C., which is a place of hard, unremitting work and

iron discipline. But the call of the C. still remains, even in these days of scientific machinery, and C.s, both in London and in the provs., lose nothing of their appeal, although to-day they are far more sophisticated than formerly. Sir Charles B. Cochran (q.v.), the great showman, was never so happy as when running a C. The greatest name in the Brit. C. world in modern times was that of Capt. Bertram Mills, whose ann. C. at Olympia drew all London, a tradition excellently carried on by his sons to-day, both in London and on the road. Other prominent names as C. impresarios are those of Tom Arnold, Chipperfield, and Billy Smart.

In America the C. has been a prime favourite in the way of entertainment for years. The vastness of the country and the multiplicity of cities, tns, and vils. made a touring C. a profitable business. The greatest name in the C. world is that of the Amer. Phineas T. Barnum, who claimed, with reason, to have the greatest show in the world. He was always producing novelties; he must have everything of the largest kind and it was he who introduced the three-ringed C., with 3 separate shows going on at one and the same time. Barnum visited Great Britain with his show from time to time and created an immense sensation by buying 'Jumbo,' the biggest elephant in the world, from the London Zoo. Col. W. F. Cody (q.v.), 'Buffalo Bill,' ran his Wild W. Show in the form of a C. The Forepaughs, Adam and John, were other great Amer. C. proprietors, as were also the Sells Brothers, Robinson and Stone, and Murray. Of recent times the Ringling Brothers have been predominant, their C.s being vast affairs, far removed from the simple outfits of the old 'tenting days,' moving in their own special trains, with a huge staff of employees. But to most people the old-fashioned C., with the smell of the tan and sawdust, the naphtha lamps, the blaring brass band, and the mysterious folk who perform their wonders with such ease, presents the main romance of the C. Of the various kinds of performers, acrobats (q.v.) of many types and kinds form the sineews of the entertainment, the core of which, in true C., must always be animals.

Cire Perdue, name given to an old method of producing bronze statues (well described by Benvenuto Cellini). The molten bronze was poured into a model made in wax over a clay core and cased over. The bronze assumed the shape of the intervening surface represented by the wax. The famous bronzes of Benin in Nigeria were made by this method.

Cirencester, parl. and urb. dist. in Glos, England, situated on the R. Churn, 16 m. SE. of Gloucester. C. was founded by the early Britons, and became a Rom. station under the name of *Corinium*. Rom. remains have been discovered, and the tn possesses a Rom. museum. The par. church dates from the 15th cent. Agriculture is the chief occupation, and there are sev. light industries. The Royal Agric. College is here, and there is a fine live-stock market. Pop. 11,540.

Cirié, It. tn, in Piedmont (q.v.), 12 m. N. of Turin (q.v.). Pop. 7000.

Ciro, It. tn, in Calabria (q.v.), near the Gulf of Taranto, 42 m. NE. of Catanzaro (q.v.). Pop. 12,600.

Cirque (Fr.) or **Corrie** (Scottish) or **Cwm** (Welsh), semi-circular basin-like hollow forming the head of a valley or excavated in the side of a mt. In cold mountainous regions snow patches accumulate in chance hollows. The alternation of freezing and thawing around these patches causes the rocks to disintegrate and the debris is carried away by avalanches and by melt-water. The hollow is thus enlarged and bites back into the hill slope. C.s where snow accumulates in the winter faster than it melts during the summer, so that a permanent snow-field forms, serve as sources from which glaciers flow. The movement of ice plucks blocks from the corrie walls and from the floor, steepening the former and often scooping out a hollow in the latter.

Cirrhosis, chronic, progressive disease of the liver. The parenchymatous cells are gradually destroyed by inflammatory processes and replaced by fibrous tissues. The initial stages of C. are associated with enlargement, or hypertrophy, of the liver—hence the name *Hypertrophic C.* Later, with the formation of fibrous tissue, the organ shrinks, becomes hardened, and takes on a yellow colour. This is called *Atrophic C.* Some lobules of the liver are sometimes affected but not others, so that the shrinkage is uneven, giving an irregular outline to the liver. C. may be caused by substances poisonous to the liver cells, such as alcohol, or by infection (see *HEPATITIS*). *Alcoholic C.* is C. of the liver due to chronic alcoholism. *Cardiac C.* is due to destruction of the liver cells and their replacement with fibrous tissue from the increased pressure in the hepatic veins in congestive heart failure. C. leads to obstruction of the portal blood system and the estab. of a collateral circulation between the portal and the systemic circulation. Obstruction of the portal system may cause ascites (q.v.). See *under LIVER*.

Cirripedia (Lat. *cirrus*, curl, *pes*, foot), order of fixed Crustaceans which includes the barnacles and acorn-shells (q.v.). All the species are marine, and live in either a parasitic or a sessile state. Nearly all the species are hermaphrodite, but in some genera dwarf male forms known as *complemental males* are also to be found.

Cirrus, see *CLOUD*.

Cirrus, in botany, tendril formed from the apex of a leaf; the corresponding adjective is *cirrose* or *cirrhose*.

Cirta, anct city of Numidia, the cap. of Massinissa and his successors. Restored by Constantine the Great, it was re-named after him. See *CONSTANTINE*.

Cisalpine Republic (Lat. *cis*, on this side, meaning on this side of the Alps, and originally so used by the Romans) was formed in 1797 by the joining of the Cispadane and Transpadane reps. formed the year before by Bonaparte. The whole rep. consisted of Mantua, Brescia,

Lombardy, Cremona, Verona, Rovigo, Modena, Massa, Carrara, Romano, Ferrara, and Bologna. The H.Q. of the gov. was Milan, and its army consisted of Fr. soldiers. It was eventually known as the It. rep., and formed the basis of the Napoleonic kingdom of Italy (1805-14).

Cisneros, Francis Ximenes de (1436-1517), see XIMENES, OR JIMENES, DE CISNEROS, FRANCISCO.

Cissampelos, genus of Menispermaceae. *C. Pareira*, the pareirabrava, is a native of sev. W. Indian is., and of Brazil. The root is employed in Europe as a tonic diuretic, and the juice of the fresh plant in its native country is said to be an efficacious antitoxin in cases of snake-bite.

Cissbury, large prehistoric earthwork with a number of deep, circular pits, in Sussex, England, 2 m. N. of Worthing. It contained flint instruments of the Stone Age. Rom. antiquities have also been found. Near by is Chanctonbury Ring (q.v.).

Cissoid (Gk *kissos*, ivy), cuspidal curve invented by Diocles, the mathematician of Alexandria. He came across it in his investigation of the problems of the trisection of a plane angle and the finding of 2 mean proportions between 2 straight lines. One method of describing the curve is as follows: In a circle draw any diameter. Then erect 2 perpendiculars on this diameter at equal distances from the centre and on the same side of the diameter. Let one of these cut the circumference in a point C, and let A be the extremity of the diameter on the same side of the centre. Join CA and let it cut the other (produced) perpendicular in P, then the locus of P is the C. curve. Its equation can be expressed in the form $y^2(2a-x) = x^2$. The tangent to the circle at the other end of the diameter is the asymptote to the curve which consists of 2 similar portions on either side of the diameter with a cusp at A.

Cistaceae, family of dicotyledonous shrubs and herbs, 6 genera, mostly Mediterranean, some American. Leaves opposite, flowers perfect with 3 to 5 sepals, 3 to 5 petals, many stamens, 1-celled superior ovary, and capsular fruit. Genera include *Cistus*, *Fumana*, *Halimium*, *Helianthemum*, *Hudsonia*, and *Lechea*.

Cistelidae, family of coleopterous insects nearly related to the Tenebrionidae, differs from it chiefly in that the species have the claws of the tarsi comb-like. Little is known about these beetles.

Cistercians, members of a religious order founded at Cîteaux (q.v.) in 1098 by a group of about 20 monks from the Benedictine abbey of Molesmes, led by their abbot, Robert of Champagne. Their purpose was a more literal observance of St Benedict's (q.v.) rule than was in vogue among the black monks at that period. The extreme austerity of the new foundation made progress difficult during the first 10 years or so; but the arrival of St Bernard (q.v.) and his companions in 1112 marked a turning-point in the order's hist. The Cistercian influence spread rapidly during the 12th cent. On the death of St

Stephen Harding, third abbot of Cîteaux, in 1134, the order possessed 84 houses; 150 when St Bernard d. in 1153; 530 in 1199; and 700 in the following cent. After 1125 there were almost as many houses of women as of men. The first Eng. foundation (1128) was Waverley Abbey, near Farnham in Surrey; and when the monasteries were suppressed under Henry VIII there were 86 monasteries and 33 convents in England and Scotland. Besides their immense spiritual influence in the heyday of the order, the C. (known also from their habit as White Monks) developed a distinctive style of Gothic architecture, relying on form at the expense of ornament, and they were pioneers of agriculture. But by the middle of the 13th cent. the order was in decline, and it was not until the Trappist reform (see TRAPPISTS) in the 17th cent. that a return was made to the original spirit of Cîteaux. To-day the Trappists have numerous houses both in Europe and America. The habit consists of a white woollen tunic, a black scapular (with hood) of the same material, a leather girdle, and (in choir) a white woollen cowl. See Manriquez, *Annales Cistercienses* (4 vols.), 1642; Cardinal Newman, *The Cistercian Saints of England*, 1844-5; H. Collins, *Spirit and Mission of the Cistercian Order*, 1866; D. Knowles, *The Monastic Order in England*, 1940, and *The Religious Orders in England*, 1948.

Cistern, small reservoir or tank installed in buildings for storage of water where supply is intermittent, to reduce pressure or to isolate distribution pipes from the water authority's mains so as to prevent pollution of the latter. Usually a 'service pipe' connects from the water authority's main to the C., into which the flow is controlled by a ball-valve. Drinking water and culinary taps are connected direct to service pipes, while water-closets, baths, lavatory basins, etc., are served by 'distribution pipes' from the C. Cs are required by the by-laws of some, but not all, water authorities.

Cisternino, It. tn in Apulia (q.v.), 27 m. WNW. of Brindisi (q.v.). Pop. 9000.

Cists (Gk *kistê*; Lat. *cista*, a box or chest) are receptacles for the body or ashes of the deceased in burials of early man. The cist is usually in a grave which may or may not be covered by a mound (see BARROWS). C. may be made of tiles, stone dressed or in the rough state, wood, or lead. They are perhaps most common in Bronze Age and Rom. contexts. In a special sense, a cist was also a small box for the sacred utensils carried in procession during the Gk mystic festivals.

Cistus, or Rock-rose, genus of Cistaceae. 20 species of evergreen shrubs native to the Mediterranean, with rose-like flowers of white, yellow, pink, purple, of which hybrid forms such as C. 'Silver Pink', C. *x lusitanicus*, C. *x corbariensis*, and C. *x cypricus* are most esteemed for gardens.

Citadel, strong fortress situated in or near a city, to keep the inhab. of the city in due order and submission, and also to form a rallying-point and last place of

defence when the tn is attacked. Famous C.s have included the Acropolis of Athens, the Rom. Capitol, and that of Cairo.

Citation, process in the commencement of a suit by which the parties are commanded to appear before the consistorial courts (see ECLESIASTICAL COURTS). In the old prerogative courts it was called a decree. In a wider sense C. denotes the act of summoning a person to appear before any judge. C. was formerly the method of commencing all probate proceedings requiring the aid of the court, whether arising out of common form business or otherwise; its object was to compel a representation to be taken by those who were primarily entitled to it, or to provide a substitute for a voluntary renunciation on their part. The word C. is also used to denote the citing of reports and authorities in a court of law to establish any proposition submitted to the court.

Cîteaux, Fr. hamlet in the dept of Côte-d'Or, N.E. of Beaune, containing the famous abbey where was founded the Cistercian Order (see CISTERCIANS) in 1098. Some of the anc't buildings remain. Pop. 250.

Cithæron (Gk *kithairōn*), or **Elatia**, range of mts in Attica, separating Megaris and Boeotia, rising to 4626 ft.

Citharinus, fresh-water fish of tropical Africa of the suborder Cyprinoides. C. *Geoffroyi*, the moon-fish of the Nile, is a well-known species about 3 ft. in length.

Cities of Refuge. These cities were 6 in number (Num. xxxv), 3 to the E. and 3 to the W. of Jordan, and were set apart to protect people who had committed murder unintentionally, and found sanctuary there.

Citium, anc't name of Larnaca (q.v.).

Citizen, see CITY.

Citral, aldehydic terpene occurring in lemon and lemon-grass oils, and in other essential oils. Chemical formula $C_{10}H_{17}O$, boiling-point 228-9°. On heating with potassium bisulphate it forms cymene. It can be obtained from geraniol, the corresponding alcohol, by mild oxidation.

Citric Acid ($C_6H_8O_7$), constituent of the juice of many fruits. It occurs in large quantities in lemons, in smaller quantities in unripe gooseberries, raspberries, etc. It is usually prepared from lemon juice, which is boiled and then treated with calcium carbonate. The resulting calcium citrate is decomposed with dilute sulphuric acid, and the C. A. filtered off, after which the filtrate is evaporated to crystallisation. C. A. is a crystalline solid melting at 100° C., soluble in water and alcohol. It has the property of preventing the precipitation of certain metallic hydroxides from solutions of their salts, and is used for this purpose in calico-printing.

Citrine, **Walter McLennan**, 1st Baron **Citrine** (1837-), trade unionist and administrator, b. Liverpool. He joined the trade union movement on Merseyside. In 1914 he was appointed dist. secretary of the Electrical Trades Union; in 1917 he became president of the Federated Engineering and Shipbuilding Trades,

Merseyside; and, in 1925, general secretary of the Trades Union Congress. He took a leading part in the struggle to secure the repeal of the Trades Dispute Act of 1927. From 1947 to 1957 C. was chairman of the Brit. Electricity Authority. He was created a peer in 1946. His pubs. include *British Trade Unions*, 1942.

Citrine, yellow pellucid variety of quartz resembling topaz in colour. This yellow strain is caused by the presence of iron oxide. Also called Sp. topaz.

Citron, or *Citrus medica*, Asiatic species of Rutaceae cultivated on account of its acid fruit. The rind is candied. The sacred C. of the Jews is *Etiop*.

Citronella, name of a fragrant ethereal oil obtained from the grass *Cymbopogon cardus*, which is cultivated in Ceylon and grows wild in Africa, Australia, and tropical Asia.

Citronwood, name applied to sev. kinds of wood used in furniture-making, is most properly applied to that of *Thuja orientalis*, a coniferous tree often spoken of as the arbor vitae of China.

Citrulline, recently discovered amino acid, first isolated from the water-melon (*Citrullus vulgaris*). It may also be isolated from the products of the tryptic digestion of caseinogen. C. is closely connected with the bodily mechanism concerned with urea excretion.

Citrus, family Rutaceae, genus of 11 evergreen shrubs or trees. *C. aurantiifolia* is the Lime (q.v.); *C. aurantium*, the Seville or Bitter Orange; *C. bergamia*, the Bergamot Orange; *C. limonia*, the Lemon (q.v.); *C. maxima*, the Pummelo or Shaddock (q.v.); *C. medica*, the Citron (q.v.); *C. paradisi*, the Grapefruit or Pomelo; *C. sinensis*, the Sweet Orange; and *C. nobilis*, the King Orange. See ORANGE.

Città Della Pieve, It. tn in Umbria (q.v.), 23 m. SW. of Perugia (q.v.). It suffered considerably during the Second World War, and many buildings, including the cathedral, were damaged. *Perugino* (q.v.) was b. here. Pop. 9400.

Città di Castello, It. tn in Umbria (q.v.), 25 m. NW. of Perugia (q.v.). It is in the Tiber (q.v.) valley, and has ancient walls, a cathedral (partly 15th cent.), a 14th-cent. tn hall, and an art gallery containing many notable pictures. There is an iron industry. Pop. (tn) 8400; (com.) 36,900.

Città Sant' Angelo, It. tn in Abruzzi e Molise (q.v.), near the Adriatic coast, 8 m. NW. of Pescara (q.v.). Pop. 3000.

Città Vecchia, see MALTA.

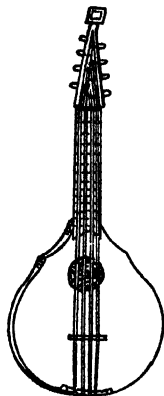
Cittadella, It. tn in Veneto (q.v.), 18 m. NNW. of Padua (q.v.), surrounded by superb walls. Pop. 12,500.

Cittanova: 1. (formerly **Casalnuova**) It. tn in Calabria (q.v.), 28 m. NE. of Reggio di Calabria (q.v.). It was built from the ruins of a former tn of Casalnuova, destroyed in an earthquake in 1783. Olive oil is produced. Pop. 14,000.

2. Vil. in Italy, 4 m. from Modena (q.v.). It represents the former Città Geminiana, founded in the 8th cent. by exiles from Modena after a Longobard (q.v.) devastation.

Cittanova (Cittanuova; Slovenian Novigrad; anct Noventum), fishing port of the Free Ter. of Trieste (q.v.), on the Adriatic, at the mouth of the Quiseto R., 25 m. SW. of Trieste. It is in the Yugoslav zone. Pop. 1500.

Cittern, or Cithern, obsolete string instrument which resembles a guitar. It was strung with brass and steel wire, and each pair of its 4 pairs of strings was tuned in unison. It was generally played with a plectrum and its music was written in lute tablature.



CITTERN

City (through Fr. *cit*, from Lat. *civitas*), bor. or tn incorporate, which is or has been an episcopal see. There are so many exceptions, however, to this definition that the term is often used indiscriminately of any large industrial centre. Constitutionally, however, a bor. only becomes a C. through Grant by the Crown by Order in Council. The Romans used the word *civitas* to denote the whole state or body politic, *urbs* and *municipium* being applied to tns. This meaning of the word has been totally lost

in modern times, but the large C.s of the U.K. and the U.S.A. do somewhat resemble the C.s of anct Greece in their local self-government. The Gk *polis* represented a collection of families, gathered together within a certain space, who administered their own foreign and domestic affairs, and had their own religion. These C.s were only bound by affection to the *metropolis* (mother city), of which they were, in a sense, colonies. The indeterminate use of the word C. probably began at a very early date. Du Cange in his glossary of medieval Lat. words defines the word *civitas* as *urbs episcopalis*, and says that tns were called *oppida* or *castra*. The modern definition, given above, is derived from his glossary, yet there were exceptions to this rule at an early period. For example, Dorchester and Sherborne were once episcopal sees, but have never been called C.s, not even now that they have corporations. In the Domesday Book Gloucester and Leicester are called both *civitas* and *burghum*. The word is now used chiefly as an honorary title, as it is thought to confer more dignity than the word *town*. In 1889 Birmingham, though not an episcopal see, was raised to the rank of a C. on account of its industrial importance; since that time the title has been conferred on many other incorporated tns in the U.K., and it is the common ambition of growing tns to be so called. At the present time Hull is a C. but has no cathedral or bishop (Beverley); also Cardiff (Llandaff).

In the U.S.A. a C. may be defined as an incorporated municipality, governed like an Eng. bor. by a mayor, aldermen, and common council. For all practical purposes the term is synonymous with municipal corporation. C.s existed in Virginia from the commencement of Amer. hist., though it is not clear that these C.s were chartered, or that the title they assumed was anything more than vainglory. In certain cases, where the pop. has grown very considerably and the tn has spread into numerous suburbs, the term C. is applied to the space within the original boundaries, as, for example, the *Cité* of Paris. Thus, curiously enough, London, which is called the largest C. in the world, has within it 2 C.s, the C. of London and the C. of Westminster. A citizen, as defined by Aristotle (*Politics*, III. 1), is one who has the right to take part in the legislative proceedings of the state to which he belongs. He is a subject with particular privileges. In anct Rome there were 2 kinds of *cives*. The majority had certain private rights of citizenship, such as the right of intermarriage (*jus connubii*) and right of trade intercourse (*jus commercii*) with the allies or friends of Rome. A few, however, had special privileges of voting in the tribe, and were eligible for the higher offices of state. The rights of citizenship were generally acquired by birth, but both parents had to be Rom. citizens. At a later period it merely denoted free birth as opposed to those who were born slaves. The word *citoyen* was particularly popular during the Fr. Revolution, as it was felt to express all that *liberté, égalité, et fraternité* comprised. It was used as the common title of address, irrespective of the person's position. The term, however, fell into disuse when the gov. came into the hands of Napoleon. In Great Britain it has never been used to any great extent, and its meaning is indefinite. See also LOCAL GOVERNMENT.

City Literary Institute, institution for adult education founded in London by the L.C.C. in the 1920's to provide day and evening classes in a wide variety of cultural subjects. Tutorial and diploma courses of the univ. of London are given. Specially designed modern buildings were opened in Stukeley St in 1938.

'City of Benares,' Brit. liner which sailed from Liverpool for Canada, 13 Sept. 1940, with a party of 90 children being evacuated from air-raided England, together with 10 adult escorts and a crew and other passengers numbering 306. Four days later she was torpedoed by a Ger. U-boat at night in mid Atlantic, 600 m. from land, and sunk. Nearly all the children were below, and many were asleep. Rescue efforts were defeated by tempestuous weather and heavy seas, many boats being swamped. There survived of the children aboard, who had sailed under an official scheme of evacuation, only 7, and of their escorts 4. The fourth officer and 32 Lascars were also saved, but the remainder, including the captain, perished. See Elspeth Huxley, *Atlantic Ordeal*, 1941.

City of London School, public school for boys founded by John Carpenter, clerk of the city, in 1442. It was estab. and erected under the authority of an Act of Parliament in 1834 on the site formerly occupied by Honey Lane Market, Cheapside. In 1883 it was removed to its present site on the Victoria Embankment. It is endowed with an ann. sum derived from certain estates left by the founder for educational purposes, and is under the gov. of the Corporation of London.

City of London School for Girls, estab. by the Corporation of London in accordance with the will of the late Wm Ward, 1881, to create a girls' school on similar educational lines to the boys' school of the same name. It is in Carmelite St, E.C.4.

Ciudad Bolívar, city and cap. of the state of Bolívar, Venezuela. It stands on the r. b. of the Orinoco and is the prin. port of its basin. Steamers run to Trinidad and along the Venezuelan coast, and in the rainy season far up the riv. It was founded in 1764 as Angostura (the Narrows), but renamed C. B. in 1864. It suffered severely in the war of Independence when for a time it was Bolívar's H.Q. It is the seat of a bishop. It exports gold, diamonds, hides, balata, coffee, cocon, tobacco, chicle, and tonka beans. The mean temp. is 83°, but the climate is healthy. Pop. 41,100.

Ciudad de Cura, see CURA.

Ciudad de las Casas, see SAN CRISTÓBAL.

Ciudad Encantada, see CUENCA.

Ciudad Juárez, tn of Chihuahua state, Mexico, on the Rio Grande border. It was formerly known as El Paso del Norte and it is connected by 3 international bridges with the Texan tn of El Paso (q.v.). Agriculture and stockraising are carried on, and it is a river, rail, and air transport centre. Pop. 48,900.

Ciudad Real: 1. Sp. prov., in Castilla la Nueva (q.v.), occupying the greater part of the former prov. of La Mancha (q.v.). Area 7622 sq. m.; pop. 576,600.

2. (anct. Alarcos, later Villa Real) Sp. tn, cap. of the prov. of C. R. It is a medieval-looking tn, with a 13th-cent. Gothic cathedral, and a 16th-cent. synagogue. It is the seat of the bishop-prior of the military orders. Textiles and brandy are manuf., and there is a market. Pop. 34,600.

Ciudad Rodrigo, Sp. fort tn in the prov. of Salamanca, on a hill overlooking the Aguada. It was taken by the English in 1706, and again in 1812 by Wellington (see PENINSULAR WAR), who was created Duke of C. R. Leather, soap, and pottery are manuf. Pop. 12,750.

Ciudad Trujillo, until 1936 **Santo Domingo**, cathedral city and resort, cap. of the Dominican Rep., situated on the S. coast of the is. of Santo Domingo. It is the oldest European tn of the Americas, having been founded by Bartholomew, brother of Christopher Columbus, in 1496. The old univ. of Santo Tomas is maintaining a high standard as a cultural centre. The city has become completely modernised, but care has been taken to protect the anct monuments. It has an

artificial harbour and is chiefly engaged in the export of sugar, molasses, cacao, hides, and timber. Pop. 181,533.

Ciullo d'Alcamo, see CIRLO D'ALCAMO.

Civet, cat-like carnivores, typical of the family Viverridae. The genus contains the largest species in its family, and, like most of its allies, has a scent gland near the sexual organs from which the perfume C. is obtained. The animals are long and thin of body, and have long heads and short ears; the legs are short, the feet are small and hairy. In habit the C.s are terrestrial, and they feed chiefly on birds and reptiles. The obnoxious and very lasting odour of C., which only on extreme dilution becomes pleasant and attractive, makes it of value as a perfume fixative. The animals are often kept in captivity in order that it may readily be extracted from them. *Civettictis civetta*, the only African species, yields the best-known C. perfume in commerce; *Viverra zibetha*, found in the Indian Archipelago, yields the widely distributed Indian C.

Civetone, ketone present in natural civet (q.v.), obtained from the civet cat and used in perfumery. It is an unsaturated ketone, melting at 31°, and having the formula $C_{17}H_{30}O$. Civetol is the corresponding secondary alcohol.

Civiale (Del Friuli), It. tn in Friuli-Venezia Giulia (q.v.), on the Natisone, 9 m. W. of Udine (q.v.). The tn dates from Rom. times, and has many anct monuments, including an 8th-cent. oratory and a fine cathedral. There is also an important archaeological museum. Textiles are manuf. Pop. (tn) 6200; (com.) 11,700.

Civil Aviation, see AIR MAIL; AVIATION, CIVIL; etc.

Civil Defence. In Great Britain the home secretary is responsible for C. D. in England and Wales, and the secretary of state for Scotland for C. D. in Scotland. Co. councils, co. bor. councils, the councils of Scottish large burghs, the authorities of the City of London, the metropolitan bor. councils, and in a few cases co. dists., are responsible for the organisation of the local divs. of the C. D. Corps. The corps comprises 5 main sections: H.Q., Warden, Rescue, Ambulance, and Welfare. Training is carried on at local centres in volunteers' spare time; the length of training varies according to the different sections. The Home Office publishes a pamphlet giving details of conditions of service.

Precautions against air-raids on the civil pop. in a future war were ignored for the better part of 2 decades after the First World War. Undue confidence was reposed in the principle of collective security, and war-weariness led to procrastination. But the devastating effects of aerial warfare on civilians were exemplified in the Italo-Abyssinian War of 1935-6, in the Jap. invasion of China in 1937-8, and in the Sp. Civil War of 1936-9; and with the increasing tension in the European political situation from 1937, public consciousness of the danger was awakened, and by 1938 most countries had developed protective measures against

explosive and incendiary bombs and gas attacks from the air.

In the U.K. the Air-Raid Precautions Act was passed at the end of 1937. The preparation of schemes for the protection of the civil pop. is the business of the Home Office working in conjunction with the local authorities. Air-raid precautions took the form of a free issue of gas-masks to the entire pop., the provision of bomb-proof shelters, the formation of decontamination squads to deal with mustard or other liquid gases in the streets, and instructions on how to render refuge rooms gas proof and the preparation of special fire-fighting apparatus. London, with its vast pop. and congested areas, presented peculiar difficulties, and plans were soon completed for at least a partial evacuation of the pop. Sound-detectors were perfected for warning the country of the approach of enemy aircraft and experiments with balloon wire-barrages were carried out. Fighter planes and anti-aircraft guns necessarily played a large part in resisting raiders during the Second World War, as well as the counter-bombing raids on enemy soil. 'Blacking-out' experiments were made before the war (1939) in various towns, combined with fire-fighting and gas-decontamination practice.

But in spite of progress in the planning of C. D., ordinary citizens living and going about their business in crowded urban areas are still particularly vulnerable. Among precautions to meet this danger are splinter- and blast-proof shelters, the strengthening of basements in certain types of houses, and the provision of communal and street shelters. The protection of works, offices, and public utility undertakings in time of war is covered by statute. By 1940 London's bitter experience of Ger. air-raids demonstrated the absolute necessity of an efficient 'fire-watching' organisation.

Early in the hist. of air warfare on open cities, air-raid precautions were necessarily of an improvised character. Sometimes, as in the case of the rock shelters of Malta, nature has provided a merciful means of protection. Again, in Hong Kong, the shelters were admirable. But experience suggests that in future wars, when the weight of bombs and bombers would be increased beyond measure, to say nothing of the development of nuclear bombs, C. D. of an altogether revolutionary and all-embracing character will become the first duty of the govts. of all states. See also FIRE SERVICE, AUXILIARY, and MOBILE DEFENCE CORPS. See T. H. O'Brien, *Civil Defence*, 1955 (*Official History of the Second World War*). Civil Engineering, see CIVIL ENGINEERS, INSTITUTION OF, and ENGINEERING.

Civil Engineers, American Society of, association of professional engineers of all branches, founded in 1852 for the advancement of engineering and architectural knowledge and practice. It holds an ann. convention in the summer, at which there are technical discussions on the various papers submitted by its special committees and at which excursions

to places of professional interest are arranged. Among the more important questions considered in recent years by the society have been the preservation and utilisation of Niagara Falls, the regulation of the flow of the Great Lakes, the engineering aspects of civil aerial transport, and the engineering features of the national cap. It now comprises about 50 local sections and nearly 100 affiliated student chapters in colleges throughout the U.S.A.

Civil Engineers, Institution of, granted a charter in 1828, in which civil engineering is described as the art of directing the great sources of power in nature for the use and convenience of man and as the means of production and traffic in states, both for external and internal trade, as applied (1) in construction of roads, bridges, aqueducts, canals, and docks for internal intercourse and exchange, and in river navigation; (2) in construction of ports, harbours, moles, breakwaters, and lighthouses; (3) in the art of navigation by artificial power for the purpose of commerce; (4) in the construction and adaptation of machinery; and (5) in the drainage of cities and towns.

Civil Estimates, expenditure of the various departments of state, excluding that of the 3 fighting services. The C. E. are pub. annually as a White Paper. They are divided into 10 classes: central gov. and finance; Commonwealth and foreign; home dept, law and justice; education and broadcasting; health, housing and local gov.; trade, labour, and supply; common services; agriculture and food; transport, fuel, power, and industrial research; pensions, national insurance, and national assistance. Between 1933 and 1938 C. E. grew steadily each year from £409,000,000 to £521,000,000. In 1945 they had risen to £1,211,190,938, of which £574,740,058 was attributable to the ordinary services and £636,450,880 to special war services. The original Estimates (including revenue departments) for 1956-7 totalled £2,953,282,938.

Civil Law. This is generally understood to mean the municipal law of the Rom. Empire, as comprised in Justinian's Institutes, Digest or Pandects, Code, and *Novellae* (supplementary to the Institutes, containing new constitutions by himself and some of his successors). These form the *corpus juris civilis*. As applied to modern systems, C. L. means the municipal law of those countries that have founded their system upon the Rom. law. Scots law is founded upon the C. L., as is the Code Napoléon. The N. states of the U.S.A. administer a system founded on common law, whereas in Louisiana a C. L. system is in vogue. Many of the principles of the canon law as administered by the eccles. courts (q.v.) are borrowed from the Rom. law. The common law (q.v.) of England is generally assumed to be indigenous, but the Eng. law merchant which is now incorporated in the common law owes much of its uniformity to analogies drawn by such judges as Lord Mansfield from, among other sources, the Rom. Pandects.

Civil List. In former times the whole expenses of the gov., except those of the army, navy, and military depts in general, were paid from the possessions of the Crown. In the reign of William III the Commons separated the regular and domestic expenses of the king from the public expenditure, and took control of the latter. From 1697 until the reign of George II the C. L. was fixed at £700,000, in the reign of George II at £830,000, and at £800,000 in the time of George III; these amounts were often supplemented by additional grants. All salaries were taken out of the C. L. at the time of William IV's accession, and the amount was fixed at £510,000. On the accession of Queen Victoria the amount was £385,000, to be devoted solely to the support of the household of Her Majesty and the maintenance of the dignity of the Crown. The C. L. for the present reign is £475,000, subject to certain deductions in respect of the balance of the Duchy of Cornwall revenues which are placed at Her Majesty's disposal during the minority of the Duke of Cornwall. See **ROYAL FAMILY.**

Civil Service. There is no statutory definition of the term C. S., which was first used in respect of the civilian sector of the E. India Co.'s personnel; but the following working definition of what constitutes a civil servant has been adopted by successive Royal Commissions: 'Servants of the Crown, other than holders of political or judicial office, who are employed in a civil capacity and whose remuneration is paid wholly and directly out of moneys voted by Parliament.' This definition excludes the staffs of the nationalised undertakings and of Trinity House and the Crown Agents, but includes those of the national galleries and museums. It excludes judges and policemen, as well as members of the gov., the officers and servants of both Houses of Parliament, and the personal retinues of the Sovereign. This difficulty of satisfactory definition reflects the fact that what is generally thought of as the C. S. comprises the staffs of a number of separate offices and depts of state, for which, in the last resort, individual ministers are responsible.

Included in the above definition, but distinct in various ways, are the staffs of the Foreign and Imperial Services (8342 on 1 Jan. 1955) and of the Post Office (246,078 on the same date). Also included are the staffs of the civil depts responsible for trade, industry, and transport (69,444), of the social service depts (65,205), of the revenue depts (65,125), of depts such as the Ministry of Works and the Stationery Office, providing agency services (21,002), of the service and supply depts (134,423), of the Home Office, co. courts, prison commission, etc. (23,761). This total of 633,380 civil servants did not include the labourers, craftsmen, and similar workers in dockyards, ordnance factories, etc., who are termed industrial civil servants. The clerks, typists, administrators, professional officers, and others who generally

come to mind when one talks of civil servants were divided in 1953 in the following proportions:

	per cent
Administrative class	4
Executive classes	9.3
Clerical and sub-clerical classes	26.9
Typing grades	3.9
Professional, scientific, and technical classes	10.0
Post Office engineering and allied grades and manipulative grades (including cleaners, etc.)	37.9
Messengers, cleaners, etc. (not Post Office)	4.1
Others	7.5
	<u>100.0</u>

In the last 100 years much has been done to draw together the staffs of various depts and offices of state into a single service. The unifying process, which may be said to have begun with the pub. of the Northcote-Trevelyan Report in 1853 and the setting up of the C. S. Commission 2 years later, has owed much to the work of a succession of Royal Commissions, to the persisting influence of the Treasury, and more recently to the service-wide apparatus of collective bargaining known as Whitleyism. The Treasury is concerned, not only with such matters as salary levels and superannuation terms and the complements of the respective depts, but with the internal discipline and efficiency of the service. In its role of personnel dept for the service as a whole, it maintains and enforces a code of procedure known as *Estatocode*, which is the 'Bible' of estab. (i.e. personnel) depts throughout the C. S. Treasury guidance, often imparted through the estab. or finance officers of the depts, has the effect of gradually reducing the scope for differences of procedure on staff matters in various depts. In their own respective fields, the Stationery Office and the Ministry of Works, which is responsible for accommodation, make a comparable contribution. The influence of the trade unions, exerted directly or through the Whitley machinery, has a similar effect, and it was from the recommendations of a Committee of the National Whitley Council in 1920 that the 3 main C. S. classes, the administrative, the executive, and the clerical, resulted. The process of unification is not by any means complete. There are still a number of special departmental grades within the home C. S.; and since 1945 a number of new nationalised undertakings have been estab. whose staffs are outside the C. S. and are not subject to direct Treasury control.

The 3 main service classes already mentioned have been heavily reinforced in recent years by professional, scientific, and technical officers, grouped in similar service-wide hierarchies; but they remain in many respects the core of the service. The tasks of the small body of administrators at the top of the C. S.

(there were less than 3000 of them in 1956) include advising ministers and helping to formulate policy, dealing with parl. questions and with correspondence from M.P.'s, drawing up the heads of new and amending legislation, co-ordinating and improving the machinery of gov., and generally administering and controlling the public service. Among their ranks are the permanent secretaries of the great depts, who, with their deputy secretaries and under secretaries, are in day-to-day, and frequently hour-to-hour, consultation with ministers, and, at a slightly lower level, the assistant secretaries, who are for the most part in charge of branches or divs. in which rather less important but vastly more numerous decisions are taken from day to day.

Within the branches, the assistant secretaries are supported by principals and assistant principals and also by members of the executive class. Nearly half the assistant secretaries and principals in the service in 1956 entered by way of another class; and since the Second World War one fifth of the ann. intake of assistant principals has been recruited by promotion from within the service. But the main highway into the administrative class still leads direct from one of the older univs. In 1953, for instance, out of 52 successful candidates in the open competition for entry into the administrative class, 26 came from Oxford, 15 from Cambridge, 5 from the Scottish universities, 5 from London, and 1 from Nottingham. Thirty-five of the 52 were educ. at grammar schools. Once inside the service, the entrant to the administrative class spends some years in the relatively ill-paid training grade of assistant principal, in which he will frequently find himself working alongside members of the executive class and doing work not dissimilar to that of a higher executive officer. He will not reach the more responsible rank of principal much before the age of 30, or the rank of assistant secretary until much later in his official career.

The small administrative class is assisted by an executive class some 20 times as large, many of whose senior members work in close touch with the administrators. The executive class was set up as a result of the report of the reorganisation committee already mentioned, which recommended that it should be given work which 'covers a wide field, and requires in different degrees qualities of judgment, initiative, and resource. In the junior ranks it comprises the critical examination of particular cases of lesser importance not clearly within the scope of approved regulations or general decisions, initial investigations into matters of higher importance, and the immediate direction of small blocks of business. In its upper ranges it is concerned with matters of internal organisation and control, with the settlement of broad questions arising out of business in hand or in contemplation, and the responsible conduct of important operations.'

The committee recommended that the executives should be recruited by open competitive written examinations of full secondary standard, from young persons between the ages of 18 and 19; and it was originally intended that the junior grade of the class should be a training grade. It was not until after the Second World War, however, that the executives began to be used over the whole of the field contemplated by the committee, and the majority of its present members have been recruited by promotion from below, not by open competition. Nor has it so far been possible to make the junior executive grade a training grade as originally intended.

Over the C. S. as a whole, the executives are now to be found engaged in accounting and contract work; the interpretation of regulations and the solution of minor problems arising out of them; the custody of precedents; estab. and similar work involving the control and supervision of junior staff; and tasks of a quasi-administrative or quasi-professional kind, involving close contact with administrative, scientific, or professional officers. There is a considerable hierarchy within the executive class, the higher grades of which can be reached only by promotion from within.

The third of the main service classes, sometimes known as the Treasury classes, is the clerical class. It is much larger than the executive class, and, as its name implies, is engaged on work that is predominantly clerical. The clerical officer is the ubiquitous foot soldier of the service and is frequently to be found in posts involving close contact with the public. This is particularly common in the social service depts, which have expanded since the war; and clerical officers are frequently found interviewing the public and dealing with their problems, under the supervision of members of the executive class, in the local offices of the Ministry of Pensions and National Insurance and the Assistance Board. A large proportion of the class consists of former temporary civil servants, recruited by special examinations shortly after the Second World War.

Among war-time trends which have not so far been reversed are the removal of less vital depts from the London area and the great increase in the scientific C. S. So far as the latter is concerned, administrative and executive civil servants have for a long time worked alongside professional officers of various kinds: lawyers, doctors, statisticians, etc. But the number and variety of specialists is for ever increasing, and it is not always easy, either in theory or practice, to decide what should be the proper role of the administrators and their executive assistants on the one hand and of professional and specialist officers on the other. Quite apart from engineers, architects, economists, and scientists of various kinds, the service has found a use within its ranks for 2 further kinds of specialists. The first is the information officer, who acts as a buffer, or liaison

officer, between the depts and the outside world. The second is the organisation and methods officer, who is concerned with internal efficiency.

The wide variety of C. S. staffs is reflected in the large number of trade unions or staff associations catering wholly or mainly for civil servants. The C. S. Clerical Association, for example, represents the clerical grades, the Society of Civil Servants the executive and similar grades, and the First Division Association the administrative grades. The Whitley System, evolved by a committee under the chairmanship of the Rt Hon. J. H. Whitley, then deputy speaker of the House of Commons, and applied to the C. S. shortly after the First World War, brings into consultation the various staff associations on the one hand and the 'official side' on the other. The system works at 2 levels, national and departmental. There is no appeal from the departmental to the national level, and in this way the constitutional position that a civil servant is responsible to his own minister is preserved. The National Whitley Council has some 50 members, half appointed by the staff associations. It works mainly through committees, and is concerned in general with issues which are service wide in their implications. The departmental councils, which are similarly constituted, deal on the other hand with matters of departmental interest. They are chaired by the permanent secretary or other official head of the dept, and the official side is led by the estab. officer, the staff side being composed, as in the case of the national council, of nominees of the associations. The C. S. Whitley system is generally considered to be a reasonably efficient piece of joint consultation machinery. How well it works, particularly at the departmental level, depends very much, however, on the degree of co-operation vouchsafed by the official side. The departmental Whitley councils and the staff associations are much concerned with promotion, and, apart from security of tenure, which has come to be taken for granted, the hope or expectation of promotion is one of the chief factors conditioning the great majority of civil servants. Promotion within the service is regulated in the main not by any system of examinations but by a combination of seniority and merit, as measured by reports made on each individual by his senior officers. These reports are made annually, in a form which varies little from dept to dept, by the civil servant's immediate supervisor, and countersigned by the man or woman one step further up the official ladder. In most depts the official head of the dept appoints a promotion board, on which he is represented by the estab. officer or some other member of the estab. branch of the office. In some depts the board merely consider the reports of those who are adjudged, usually with the agreement of the staff side, to fall within the ambit of promotion. In others they also interview some of the most likely

candidates. At the highest level posts are filled only after consultation between the permanent secretary in the Treasury, who is the official head of the C. S., and the Prime Minister.

The structure of the service as a whole was last looked at by a Royal Commission in the years 1929-31, when the Tomlin Commission surveyed a scene which still bore numerous traces of the First World War. Since that date the service has undergone considerable growth and adjustment to new conditions. During the Second World War, for instance, there was a great influx of temporaries, and after it there were new functions to be performed. In 1947 a number of changes were made which had the effect of narrowing the gaps between the 3 main classes (administrative, executive, and clerical) and of simplifying the grading of the last mentioned. In 1953 a Royal Commission was appointed, under the chairmanship of Sir Raymond Priestley, to inquire into the pay, as distinct from the structure, of the C. S. It made a number of specific recommendations on pay and conditions of service which were subsequently the subject of negotiation between the 2 sides of the National Whitley Council and resulted in new pay scales and the introduction of the 5-day week, accompanied by an appropriate reduction of the leave allowances of various categories of civil servants. More fundamentally, the Royal Commission recommended that the principle of 'an efficient service fairly remunerated' should be adopted in fixing C. S. pay, and proposed that this object should be attained by a process of fair comparison with the remuneration of outside staffs engaged on broadly comparable work. To this end a C. S. Pay Research Unit has been set up, under the general control of a committee of the National Whitley Council, with a C. S. staff under a director appointed by the Prime Minister. The degree of efficiency with which this unit does its work may well affect decisively the level of service efficiency over the next decade, since the C. S. is no longer in the position of being able to get and keep without difficulty the kind of staff it needs.

The Brit. C. S. possesses what an Amer. authority has defined as the 6 primary criteria of bureaucracy: 'differentiation of functions; qualifications for office (as distinct from patronage); hierarchical organisation and discipline; objectivity of method; precision and consistency or continuity, involving adherence to rules, red tape, and the keeping of records; and lastly the exercise of discretion, involving secrecy in regard to certain aspects of government.' Machinery of this kind is indispensable if modern gov. is to carry out the large tasks it has assumed with efficiency and equity. The virtues of such a bureaucracy have been summarised by Prof. Robson as follows:

'It uses objective methods of recruitment in place of nepotism and patronage; it seeks to promote according to merit rather than for political or personal

reasons. It administers on the basis of rules, precedents, and policy, rather than on ground of personal feeling, influence, or favouritism. It tries to formulate quantitative measurements of efficiency. It aims at consistency of treatment in its dealings with the public.'

It is unfortunately true, however, that the Brit. C. S. is not exempt from the faults common to large bureaucratic organisations, whether governmental or non-governmental, which have been categorised by the same authority as follows:

'The maladies from which bureaucracy most frequently suffers are an excessive sense of self-importance on the part of officials, or an undue idea of the importance of their office, and indifference towards the feelings or the convenience of individual citizens; an obsession with the binding and inflexible authority of departmental decisions, precedents, arrangements or forms, regardless of how badly, or with what injustice, they may work in individual cases; a mania for regulations and formal procedure; a preoccupation with the activities of particular units of administration and an inability to consider the government as a whole; a failure to recognise the relations between the governors and the governed as an essential part of the democratic process.'

Four factors have so far prevented these faults from getting out of hand: pressure exerted by Parliament, by means of parl. questions, correspondence on behalf of individuals, and watchful scrutiny of orders and regulations; the critical eye of the press, and to some extent of those concerned with radio and television; the activities of such bodies as local authorities, trade unions, trade associations, and other pressure groups, on behalf of those they represent; and a growing tendency to self-criticism, shown by such things as new organisation and methods, and by the activities of training branches and of departmental Whitley Councils. The first 3 of these influences have helped to prevent the development in Britain of the more alarming faults displayed by official bureaucracies elsewhere; the fourth has made some impression on the procrastination, circumlocution, and sheer muddle which developed such alarming proportions during, and immediately after, the war. It is to this process of internal self-criticism that we shall have increasingly to look for improvements now that the service is engaged on so many, such large, and such multifarious tasks.

Where the scene is constantly changing it is easier to point to continuing sources of information than to recommend textbooks. Of the former the files of 'Public Administration,' the 'Whitley Bulletin,' and the journals of the staff associations are the most important. Figures for the departmental distribution of staff are to be found in a quarterly command paper; and the *Introductory Factual Memorandum on the Civil Service*, submitted by H.M. Treasury to the Royal Commission in 1953, gives a detailed account

of the staff structure of the service as it was at that time. The hist. of the service is dealt with in *The Growth of the British Civil Service, 1780-1939*, by Emmoline W. Cohen, 1941, and the account is brought up to date in *Civil Service or Bureaucracy?*, by E. N. Gladden, pub. in 1956. *The Civil Service in Britain and France*, ed. by Prof. Robson, contains a number of useful essays on various aspects of the service, and the 'New Whitehall Series,' ed. for the Royal Institute of Public Administration by Sir Robert Fraser, provides detailed accounts of various important depts. *The Higher Civil Service of Great Britain*, by H. E. Dale, pub. in 1941, and *The Civil Service: Some Human Aspects*, by Frank Dunnill, pub. in 1956, contain a great deal of interesting background information. See also separate articles on the individual ministries and boards.

Civil War, armed conflict between opposing groups of the same nationality within the same country. Foreign examples include the Amer. C. W. (1861-5) and the Sp. C. W. (1936-9).

In England, the term is specifically appropriated to the Eng. C. W., 1642-9. This falls into 2 divs.: (1) from 1642 until the Royalist defeat at Naseby, 1645; (2) from Charles I's 'engagement' with the Scots in 1647 until his execution in 1649. From 1650 until 1651 fighting again flared up, but it ended after Cromwell's victory at Worcester.

The First Civil War. The basic causes of the war were deep-rooted. Modern parl. power began when Henry VIII used Parliament to ratify his religious changes. Under James I, the conflict between Crown and Commons developed and a definite opposition party emerged. In the closing years of Elizabeth's reign, the growing fissures in the Tudor constitutional fabric were hidden by the influence of the queen's personality. The ambiguous character of Elizabeth's religious 'settlement' meant that a final religious settlement was merely postponed. Calvinism grew during her reign. It permeated the 2 classes which had received substantial material and political benefits from the Reformation and from the expansion in colonial enterprise and trade during the 16th cent., namely, a section of the squirearchy and most of the large merchants. It was these classes who returned and were returned as members of Parliament; and their power was increased by the rise in prices throughout the 16th cent., which benefited them more than the Crown, whose revenue was largely fixed.

Poor Stuart statesmanship bared these problems and added to them. James's extravagance and leanings towards the unpopular Arminians angered an already difficult Parliament. His lack of tact in the dispensing of patronage lost him the support of essential interests. Charles I increased the Crown's unpopularity by ardently supporting Arminianism, and by his foolish choice of advisers. His instability hampered the work of his best servants, like Strafford, and set a critical Commons almost continuously on the

offensive against him. The Commons (1603-42) underestimated the expenses of the gov., and represented a religious opinion which, in its positive form, was far from universal, but the clumsiness of the monarchy incited them to press their criticisms and demands to extremes, and gave them a following among the mob.

The Scottish wars precipitated the conflict, forcing Charles to summon Parliament, after 11 years of apparently successful 'personal rule,' to obtain essential supplies. The over-confidence of the Puritan parliamentarians who returned to Westminster in 1641 led them to excesses in religious and political views which did much to cause the creation of a Royalist party, and to occasion the fighting. Parliament was agreed on many subjects. Between Feb. and Aug. 1641 the king agreed to a series of limitations on his powers, such as the abolition of the Star Chamber. But the debates on the 'root and branch' (see ROOT AND BRANCH MEN) petition of Dec. 1640 showed that an unforeseen religious div. existed. A strong minority emerged which, though anti-Arminian, was not prepared to sacrifice the episcopal structure and the Book of Common Prayer (see ROYALISTS). When in Feb. 1642 Charles left Whitehall for York, many moderates joined him, and the Puritan extremists in the Commons gained the upper hand. Parliament demanded control of the militia and Charles refused.

War was at this stage virtually inevitable. The main strength of both parties at the outset was drawn fairly equally from the upper and middle classes. Their fighting men held, in the main, only slightly different views on the fundamentals of politics and religion, and though sev. historians have variously tried to base the party div. on geographical, economic, religious, or constitutional issues, the decisive factor in influencing many men's choice in favour of royalism would seem to have been their concept of loyalty so well expressed by Sir Edmund Verney (see under ROYALISTS) and the poet Lovelace. Though some Puritans (q.v.) were actuated by religious motives and others by constitutional beliefs (as in the case of Ralph Verney), many people were attracted to this party by economic or political grudges. This diversity of interest made the original Puritan party divide so rapidly in victory. Its cohesion was largely based on destructive motives. Parliament, however, controlled London and most of the ports, and soon gained control of the navy. At first Charles could rely on generous gifts of jewellery and plate from his nobles and squires to finance his army, but in the long run the wealth of London was to tell against him. Even so, had the king possessed a general of Cromwell's calibre he might have won the war.

Military significance of the wars. England in 1642 did not support a large professional military class, though in theory a large militia force existed. At first the

Royalist cavalry was superior, and the Royalist infantry inferior, to that of the Parliament. A majority of the rural gentry were for the king, and horsemanship was still the accomplishment *par excellence*. The Parliament foot contained from the outset a high proportion of the only efficient element of the militia, the urb. Trained Bands (q.v.). Here the question of arms was more decisive. Muskets and pikes had to be bought largely abroad, and the Parliament's financial and naval resources were telling. As the war went on, the training and equipment of the king's infantry improved, but not so fast as that of the Parliament's cavalry. On both sides there was a professional element of officers who had seen foreign service. Cavalry became the dominant arm, and once the Royalists had lost their superiority in this connection they lost the war. The great military development of the C. W. was the estab. of the New Model Army (q.v.), which contained the germ of a general staff and a permanent system of transport and supply.

Campaigns (1642-5). In July 1642 the Commons resolved to recruit an army and in Aug. the royal standard was raised at Nottingham. An indecisive battle was fought at Edge Hill on 23 Oct. The king estab. his H.Q. at Oxford. In Nov. he moved against London, retreating in face of the large forces assembled at Turnham Green. Charles was provided with well-conceived plan for the 1643 campaign. The Earl of Newcastle from the N., and Hopton and Prince Maurice from the W., were to converge on Oxford and unite with the king's own force to attack London. In Lincs, Newcastle's officers refused to advance further against the strong opposition of the E. Association troops under Cromwell, while Hull lay in Parl. hands in their rear. In Sept. Parl. forces gained a victory at Winneby (where, in Cromwell's words, his soldiers charged 'singing psalms'), recaptured Lincs, and relieved Hull. In the SW. Hopton over-ran Devon, Dorset, and Wilts, and reached Sussex by Dec. But his Cornish forces refused to leave Plymouth in Parl. hands in their rear and Hopton retreated. Rupert took Bristol in July, but the Welsh border Royalists refused to advance on London while Gloucester held out for Parliament, and Charles was forced to besiege it. He raised the siege when a force under Essex marched to relieve the city. Charles's force then blocked the route back to London at Newbury, where it was attacked on 20 Sept. Shortage of powder compelled a Royalist retirement and Essex's forces reached London. By Oct. 1643 the balance had tilted against Charles. His plan had failed, a result to which the navy had contributed by supplying Hull and Plymouth, and for which the Royalists themselves, in refusing to leave their own areas, were much responsible. The Scots had entered the war on the side of Parliament, and in 1644 shut up Newcastle's forces in York. Waller checked Hopton's advance in

Hants, and in May Cromwell and Manchester joined the Scots before York. Rupert came N., skillfully relieved the city, but was defeated at Marston Moor on 2 July. This destruction of the king's N. army and the capture of York secured N. England for Parliament, and Charles was on the defensive for the rest of the war. There was, however, a temporary recovery during the remaining months of 1644, when Essex's foot were trapped at Lostwithiel, and Basing House was relieved. As a result Parliament decided to replace its outmoded systems of warfare. The New Model (to whose members the term Roundhead (q.v.) is most applicable) was estab. by an ordinance of 15 Feb. 1645, and commanded by Fairfax. By the Self-Denying Ordinance members of Parliament resigned their commands and left the question of re-appointment to Fairfax. Philip Skippon (d. 1660), who had served in the Low Countries, and had been angered by Essex's desertion at Lostwithiel in 1644, was made major-general of foot and chief of staff, and Cromwell became lieutenant-general of horse in May. In summer Fairfax took the field. Cromwell joined the New Model on 13 June. On 14 June he and Fairfax decisively defeated Charles at Naseby. In July Fairfax came upon Goring's demoralised army at Langport, in Somerset. It broke and fled. In Sept. 1645 Montrose was defeated by Leslie at Philiphaugh. Hopton surrendered in Cornwall in Mar. 1646, and Oxford fell in June. Charles had already surrendered to the Scots at Newark.

The Second Civil War. In 1646 it was generally assumed by all but the extreme sectaries that Charles would be restored with severely limited authority. Charles, however, was determined to regain his former position, and, shut away from his moderate advisers, his restraint vanished. The numerically inferior Presbyterians caused bitter hatred amongst their opponents by adopting unnecessarily extreme measures, such as the abolition of the Prayer Book, and the levying of heavy fines on Royalists. Parliament then broke up its own party by attempting to impose a Presbyterian State Church on all, and by proposing to disband the largely independent New Model (q.v.), without granting its arrears of pay. The army marched on London and expelled 11 leading Presbyterians from Parliament. This opened the phase in which the sectaries, whose part in causing the war was unimportant, became all powerful. In using them to fight their battles and, therefore, having of necessity to grant them temporary religious freedom and unprecedented liberty of speech, the more moderate Puritans had, in effect, surrendered control of affairs to them. Cromwell, one of the original Puritan opposition, rose to supreme power because of his generalship and emotional hold over his troops, and not by virtue of his parl. membership.

The victory of Independency in the Puritan struggle for power encouraged

and enabled the king to come to terms with the Presbyterian Scots. The apparent indiscipline of the Eng. army and the fact that the Eng. Presbyterians (whose importance he very naturally overestimated) were quarrelling with their former followers made Charles think that he could win a quick victory over a divided enemy. The renewed sacrifice which the second war entailed ensured that countless Royalists, who had consistently supported Charles, would be financially ruined.

Charles's 'engagement' with the Scots of Dec. 1647 provided for a Scots invasion of England and a Royalist rising. In July 1648 the Scots occupied Carlisle, but the following month Cromwell, having marched from Pembroke, fell on them, and in a running battle from Preston to Warrington completely destroyed their army. Charles was captured.

The New Model was now supreme. In Dec. 1648 Pride 'purged' Parliament of all opposition, leaving a 'Rump' of 50 Independents. Cromwell and other army leaders had now decided that as Charles could never be trusted to keep to any agreement which they might make with him, his death was essential to safeguard ideals for which they had fought. His execution in Jan. 1649 drove the wavering Eng. Presbyterians over to an apathetic royalism. Very soon some of the sectaries became disillusioned, and contemplated a compromise with royalism. The Scots were generally agreed on the subject of loyalty to a Stuart king. These factors encouraged Charles II to attempt a Restoration by force through Scotland.

The War of 1650-51. In 1650 Charles II came to humiliating terms with the Scots Presbyterians. Cromwell, now commander-in-chief, crossed the Tweed in July, but was hemmed in at Dunbar by Leslie. Then Leslie left his strong position on the hills, and on 3 Sept. was utterly destroyed. Within a year Cromwell was master of Scotland. A race to the S. between Cromwell and Charles's forces now began, but on 3 Sept. 1651 the Royalist army was surrounded and destroyed in Worcester. After several narrow escapes Charles II reached France.

The C. W.s resulted in the immediate triumph of the army. England became a Commonwealth, ruled by a Council of State (dominated by army leaders) and the Rump Parliament. The real source of the Commonwealth's power was its superb army of 50,000 veterans, mostly Independents, and Cromwell, its commander. These had executed the king in the name of the people only to find that many who had fought with them against him now disowned them for this deed. For a time, by sheer force, the army was able to pursue its objectives. The Rump was dissolved: but the religious radicalism of the Barebones Parliament convinced Cromwell that only a more conservative attitude could save the essentials of the revolution, and the dissolution of this body marks the beginning of the end

of army rule and the return to more traditional methods of gov. Throughout the Protectorate, old monarchical forms were gradually revived. Had Cromwell lived some years longer, a Cromwell dynasty might have been estab. in England. As he left no strong successor in his own family, his conservative policy, with its re-estab. of traditional ideas and interests, paved the way for a Stuart restoration (q.v.). But in spite of this the C. W. effected a number of lasting changes. The interval of army power ensured the permanent estab. of a radical Nonconformity which had little connection with the religious ideals of most of the original Puritans, who had fought for an estab. Calvinist Church of England, and not for tolerated sectarianism. The Cromwellian excesses in Ireland contributed substantially and lastingly to Irish Catholic hatred of the English. Politically, the temporary victory of the Puritans ensured that England did not develop the form of monarchical absolutism which was springing up in other European countries, such as France, at the same date, and towards which Charles I's England was probably moving. The real victors of the C. W. were the wealthy merchants and landowners of the Ashley Cooper type who managed to support the winning side of the moment successfully throughout; in fact, the king returned on their terms, and the sacrifices of the small Royalist squirearchy and the New Model soldiery led to the estab. of an oligarchy from which modern Brit. democracy was eventually to evolve. One of the most astonishing features of the war was its failure to disrupt substantially the national economy. But though the country's financial position suffered comparatively little, no statistical records can illustrate adequately the amount of personal suffering and private loss sustained during the conflicts, a factor vividly illustrated in the various family memoirs of the period.

See *Diaries, Journals, and Memoirs: Commons and Lords Journals for the Period: The Hatfield MSS.; Pepys's Diary; Evelyn's Diary; The Knynett Papers; D. H. Holles, Memoirs, 1641-58, 1699; The Clarendon State Papers, 1707-86; T. E. Gibson (ed.), The Crosby Records: A Cavalier's Notebook, 1877; and Frances P. and Margaret M. Verney (ed.), The Verney Papers, 1892-9. GENERAL. W. Prynn, The Sovereign Power of Parliaments and Kingdoms, 1643; J. Lacy, The Old Troop, 1672; Edward Hyde, Lord Clarendon, History of the Great Rebellion, 1702; T. Carlyle, Letters and Speeches of Cromwell, 1850; F. P. G. Gulzot, Life of Cromwell, 1854; S. R. Gardiner, History of England, 1884, A History of the Great Civil War, 1842-49 (4 vols., new ed.), 1910-11, and The Constitutional Documents of the Puritan Revolution (latest ed.), 1910; H. A. Glass, The Barebones Parliament, 1899; W. A. Shaw, A History of the English Church, 1640-60, 1900; T. C. Pease, The Leveller Movement, 1916; C. H. Firth, Oliver Cromwell and the Rule of the Puritans,*

1923; R. H. Tawney, *Religion and the Rise of Capitalism*, 1926; Mary Coates, *Cornwall in the Civil War*, 1933; G. Davies, *The Early Stuarts*, 1937; Margaret James, *Social Problems during the Puritan Revolution*, 1938; A. S. P. Woodhouse, *Puritanism and Liberty*, 1938; M. Ashley, *Oliver Cromwell*, 1940; W. Schenk, *The Concern for Social Justice in the Puritan Revolution*, 1948; D. Mathew, *Social Structure in Caroline England*, 1948, and *The Age of Charles I*, 1951; C. V. Wedgwood, *The King's Peace*, 1955; A. French, *Charles I and the Puritan Uplheaval*, 1956.

Civil War, American, see UNITED STATES, History.

Civil War, Russian (1917-22), followed the seizure of power by the Bolsheviks (see OCTOBER REVOLUTION) and the forcible dissolution of the Constituent Assembly (q.v.). There were 4 main fronts of the C. W., the E., the S., the N., and the NW., the first 2 being by far the most important. The E. front was first opened by the uprising of the Orenburg Cossacks under Gen. Dutov in Nov. 1917, and fully estab. after the overthrow of Soviet power in Siberia, the Urals, and the Middle Volga region in May-July 1918. Apart from the initial period the anti-Bolshevik forces in the E. under Adm. Kolchak (q.v.) were most successful in Mar. 1919, when they again approached the Volga; then followed a continuous retreat until Kolchak was captured in 1920 and Vladivostok taken in 1922. Similarly, the S. front was opened by the Don Cossacks under Gen. Kaledin (q.v.) in Dec. 1917 and fully estab. with the first successes of the Volunteer Army under Gen. Denikin (q.v.) in N. Caucasus in the summer of 1918. Denikin became a serious menace to the Soviet power in the summer and autumn of 1919, when his forces occupied most of S. Russia and the central black earth region and advanced towards Moscow. Here also followed a series of defeats, and a retreat which, after some new successes in S. Ukraine under the new commander Gen. Wrangel (q.v.), ended in the evacuation of Sevastopol' in 1920. The anti-Bolshevik forces in the N. were weak and largely dependent on the allied troops under Brit. leadership which landed at Murmansk and Archangel in July-Aug. 1918 and left in the autumn of 1919, after which the front was liquidated early in 1920. The NW. front resulted from the advances of a White army under Gen. Yudenich from Estonia aimed at capturing Petrograd (May-Nov. 1919); these advances were beaten off. On the Red side the most distinguished leader in the C. W. was the war commissar and chairman of the Revolutionary Military Council, Trotsky. Colonels Vacetis and S. S. Kamenev were successively commanders-in-chief. Among the successful Red commanders in the field were former professional revolutionaries (Antonov-Ovseyenko, Frunze, Voroshilov), as well as imperial army officers (Tukhachevsky) and N.C.O.s (Hudennyy). The war effort in the rear was organised by the Council of Labour and Defence

headed by Lenin and by the Council for Army Supply headed by Krasin. The social composition of the Red and the White armies was almost identical, peasants making up the bulk in both, with considerable numbers of industrial workers in the ranks and professional soldiers and intelligentsia predominating among the officers (and among the political commissars on the Red side). The total numbers taking part in the C. W. were remarkably small, the majority of the pop. remaining passive. On the White side were the majority of Socialist Revolutionaries, right-wing Social Democrats, and all parties to the right of them, the latter gradually gaining more and more ground. On the Red side, apart from Bolsheviks, were the Left Socialist Revolutionaries, left and centre Social Democrats, and Anarchists. The main causes of the Red victory were political—the Whites had failed to produce a unifying idea and a sense of common purpose, and they antagonised the peasants by restoring land which the latter had seized to the owners. The C. W. was complicated by the intervention of the Allies, who wanted to re-establish the E. front against the Central Powers, and of Germany, Turkey, Rumania, and Poland, who had territorial designs (as also had Japan). This foreign intervention was sometimes of considerable importance (e.g. the Austro-German occupation of the Ukraine, the Czechoslovak uprising in 1918 along the Trans-Siberian Railway), but after the defeat of Germany the Allies lost interest in the Russian C. W. Other causes of complications were strong particularist tendencies (the Cossacks, Siberia, the Far E.) and the separatist movements on the periphery of the country, which led to the estab. of a number of independent states (Poland, the Baltic states, Transcaucasia), and of ephemeral nationalist govts. (the Ukraine, central Asia). In some places (the Kuban' region, central Asia) sporadic armed resistance to the Bolsheviks lasted until 1924 or even longer, almost until the new flare-up during the collectivisation of agriculture (q.v.). See G. Stewart, *The White Armies of Russia*, 1933; J. Bunyan, *Intervention, Civil War, and Communism in Russia*, Baltimore, 1936; L. I. Strakhovsky, *The Origins of American Intervention in North Russia*, 1918, Princeton, 1937; A. G. Gordon, *Russian Civil War*, 1937; A. Soutar, *With Ironside in North Russia*, 1940; W. H. Chamberlin, *The Russian Revolution* (vol. II), New York, 1954; R. Pipes, *The Formation of the Soviet Union*, Cambridge, Massachusetts, 1954; L. B. Schapiro, *The Origin of the Communist Autocracy*, 1955.

Civita Castellana, It. tn in Lazio (q.v.), 19 m. SE. of Viterbo (q.v.). It is a picturesque tn, built on a high rock, and has a 13th-cent. cathedral and a 15th-cent. castle. Near by are the ruins of the Etruscan city of Falerii (q.v.). Pop. (tn) 7500; (com.) 11,500.

Civitanova Marche, It. tn in the Marches (q.v.), 12 m. W. of Macerata (q.v.). Pop. 7000. Its port, called Porto Civitanova,

on the Adriatic coast 3 m. E., is now a separate com. Pop. 8000.

Civitas Altae Ripae, see BRZEG.

Civitas Cemenellensis, see CIMIEZ.

Civitas Episcoporum, see OVINO.

Civitavecchia (anct. *Portus Trajani*), It. seaport in Lazio (q.v.), on the Tyrrhenian Sea, 35 m. NW. of Rome (q.v.). The port was built by Trajan (q.v.), and is one of the best and busiest in Italy; it also provides one of the links between Sardinia (q.v.) and the mainland. The tn has a 17th-cent. cathedral, and a citadel designed by Bramante and completed by Michelangelo (qq.v.). The harbour and tn suffered very severely during the Second World War, but much of the damage has been made good. There are Rom. and Etruscan remains. Aluminium, cement, foodstuffs, and calcium carbide are manuf. Pop. 34,600.

Civitella del Tronco, It. tn in Abruzzi e Molise (q.v.), 8 m. N. of Teramo (q.v.). It is built on a hill, and is overlooked by a castle. Pop. (com.) 9600.

Civitella di Romagna, It. mrkt tn in Emilia-Romagna (q.v.), on the Rabbi, 15 m. SSW. of Forlì (q.v.). Pop. 7000.

Civray (anct. *Severiacum*), Fr. tn in the dept of Vienne, on the Charente. It has a trade in mules. Pop. 2700.

Clackmannan: 1. Smallest co. in Scotland, bordered on the SW. by the Forth and lying between the co. of Perth, Fife, and Stirling. The SW. extremity of the Ochil Hills (Ben Clouch, 2363 ft) occupies the N. half of the co. and is in marked contrast to the low-lying carse between the hills and the R. Forth. The Devon and the Black Devon are the principal rivers. Approximately two-thirds of the co. is cultivated, and oats, wheat, and beans are the chief crops. Cattle and sheep are reared. Coal has been worked for nearly 3 cents., and a new mine sinking is being developed to extract the remaining productive coal measures in the Devon valley. The main manufacturing industries are general engineering, textiles, distilling and brewing, printing and paper, woodworking and glass manuf. The chief tns are Alloa (the co. tn), Alva, Tillicoultry, and Dollar. Woollen manufacturing and paper processing are carried out in the Hillfoots tns. Central and E. Stirling form a single par. div., returning 1 member. Area 34,983 ac.; pop. 37,532.

2. Anct tn of the above co., situated on the R. Devon, 2 m. from Alloa. By virtue of its name and historical background it was at one time the co. tn, and for many generations the seat of the Bruce family in Scotland. C. Tower, Tollbooth, and Mercat Cross are invaluable records in stone and lime of traditional Scottish architecture, and the narrow High Street, leading from the Tollbooth to the Tower, flanked by the very fine par. church to the S., would seem to have formed the site of the original hill tn. Pop. 2500.

Clacton-on-Sea, seaside resort of Essex, England, 70 m. from London by rail and also connected with it by daily express coach services, and steamer services from

the Thames during the summer. It has 5 m. of sandy beaches, and a promenade and marine parade 2 m. long. Co. cricket matches are played here during the season. Pop. 25,000.

Cladium, genus of Cyperaceae, consists of tropical and temperate plants which are extremely common in Australia. *C. germanicum*, prickly twig-rush, which derives its name from the almost prickly margins of the leaves, these latter being themselves rough, is found in various parts of England, besides being abundant in parts of Scotland.

Cladocera, or **Water-fleas**, form a sub-order of branchiopod crustaceans characterised by having not more than 6 pairs of trunk-legs.

Cladonia, genus of fruticose lichens, has sev. Brit. species. The shape of its branches gives it the appearance of a bundle of small worms or of vermicelli. *C. rangiferina*, the reindeer moss, occurs frequently on moors, heaths, and mts. In Lapland it is the most abundant of all plants, and is found chiefly in pine forests, covering the soil for miles together; it forms the prin. support of the reindeer.

Cladoselelchians, primitive order of shark-like fishes which lived in Devonian and Carboniferous times.

Claim of Right, The: 1. Act passed by the Scottish Estates in April 1689, stating the offences for which James VII had forfeited the crown, and the terms on which it was accordingly offered to William of Orange. It enacted that in future no papist should rule over Scotland, and declared the necessity of frequent parliaments.

2. Petition made by a majority of the Scottish General Assembly in 1842 against patronage and sent to the Parliament of Westminster. It stated their feelings with regard to the relation of the State to the Church. The terms of the petition were not granted by the gov., and accordingly in the following year 400 ministers seceded and formed the Free Church of Scotland (q.v.).

Clair, René (1898-), Fr. film producer and director, b. Paris. Silent films include *Paris Qui Dort* and *Le Chapeau de Paille d'Italie*. Among his sound films are *Sous les Toits de Paris*, *Le Million*, and *A Nous la Liberté*. His Eng.-speaking films include *The Ghost goes West*, *Flame of New Orleans*, *I Married a Witch*, and *It Happened To-morrow*, while more recent Fr. films are *La Benite du Diable* and *Les Belles de Nuit*. He has pub. *Star Turn*, 1936, and *Reflections on the Cinema*, 1953. In 1957 he was awarded the Grand Prix du Cinema Français for *Porte des Lilas*.

Clairaut, Alexis Claude (1713-65), Fr. mathematician, b. Paris. He produced at the early age of 12 a treatise on 4 curves of the second order; this, together with his *Recherches sur les courbes à double courbure*, 1731, caused him to be elected a member of the academy when 19. His *Théorie de la lune*, 1752, which gained the prize at St Petersburg Academy, explains the lunar apogee, which had been omitted by Newton. He also calculated the path of Halley's comet, and wrote sev. papers

on the orbit of the moon. He evolved a theorem connecting the gravity on the surface of a rotating ellipsoid with the compression, and the centrifugal force at the equator.

Clairon (Claire Joséphe Loris) (1725-1803), celebrated Fr. actress, was b. near Condé in Hainaut. After playing in prov. tns and foreign countries, she made her debut at the Comédie Française in the part of Phaedra. The time of her fame was 1743-66; she played many roles and excelled in Voltaire's tragedies. C. wrote her own memoirs (1798). There is also a life by Edmund de Goncourt, 1900.

Clairvaux, hamlet in the com. of Villersous-la-Forté, in the dept of Aube, 33 m. ESE. of Troyes. It is famous for its great abbey founded by St Bernard (q.v.) in 1115. The abbey was suppressed during the Fr. Revolution, and the building is now used as a prison. See also CISTERCIANS. Pop. 700.

Clairvoyance, alleged faculty of being able to see objects not ordinarily visible to human eyes, and from these objects to describe events that are taking place at a distance. See PSYCHICAL RESEARCH.



GIANT CLAM

Clam, term applied to many Eulamellibranchiate molluscs varying in importance in different countries. In Scotland the scallops (*Pecten*) receive this name; they are edible creatures which swim by flapping the valves of their shells. In England the very various genera *Macra* and *Mya* are known as C.s, *Mya truncata* being the soft C. The term is largely applied in the U.S.A. to sev. species of bivalve molluscs of somewhat the same order as the Scotch scallops and the Eng. cockle. The name originates from the firm manner in which the creature closes its shell when alarmed. Two kinds are eaten in the U.S.A., the soft shell C. and the hard shell. The latter is sent in great quantities to the markets. It is eaten

both raw and in a soup called C. chowder. The species are *Venus mercenaria* or hard C., and *Mya arenaria* or soft C. C.-shell is the King, name of the bivalve shells belonging to the molluscan genus *Tridacna*, and specially of *T. gigas*, which sometimes measures 2 ft across. A pair of valves weighing upwards of 500 lb. were used as a receptacle for holy water in the church of St Sulpice, Paris.

Clamart, Fr. tn in the dept of Seine, a SW. suburb of Paris. It is residential, and has textile manufs. Pop. 33,900.

Clamecy, Fr. tn, cap. of an arron., in the dept of Nièvre, at the confluence of the Beuvron and the Yonne, and on the Nivernais Canal. It has chemical manufs. Pop. 5800.

Clan (Gaelic *clann*, meaning children), group of kin descended through male or female descent from a single ancestor. Among primitive peoples the basic organisation of family and society is commonly by C.s (see Fortes and Evans-Pritchard, *African Political Systems*, 1940). The highland C. of Scotland was the most highly developed of recent times. It was confined to the highland regions. The chief represented the common ancestor, and exercised patriarchal control over the clansmen. The name of the C. was frequently composed of that of the founder, with the addition of Mac (meaning 'son of'); thus we have the C. MacDonald, the C. MacPherson, and similar names. The chief of a C. ruled by the right of primogeniture, and was revered and obeyed by his clansmen. Each C. in Scotland occupied a separate portion of ter., and not infrequently bitter rivalry existed between the neighbouring C.s. In the later years of the C.s the Scottish Gov. made it a rule that every C. should supply at court a representative of rank to give security for their good behaviour. Should a C. refuse to do so they were termed a 'broken C.' and were proscribed and in a state of outlawry. The MacGregor C. was a notable example of such, holding their lands for long by the *coir* or glaive, or right of sword. The C.s played a large part in the rebellions of 1715 and 1745. After the suppression of the latter the Brit. Gov. took steps to break up the C.s. Hereditary jurisdiction was abolished, and the people were disarmed and forced to cease wearing their national costume. To-day few traces of the C.s remain save in the persons of chiefs officially recognised as such by the inheritance of ancestral arms, and in the C. associations founded on sentiment. See F. Adams, *The Clans, Septs and Regiments of the Scottish Highlands*, 1935.

There are in Ireland also recognised C.s, the various branches of which gather together from time to time. In Ireland the adoption of strangers into the family or C. was common, the adopted person being called Mac Faois (son of protection). A group of C.s associated into tribes was called a Cinel or Kinel, of which the Kinel-Owen, named after Owen, son of Niall, is an example, comprising the C.s of O'Cahan, MacQuillan, O'Flynn, and

many others, all tributary to the chief O'Neill.

Clan Line, Eng. shipping company, founded in 1878 with a fortnightly service between Liverpool and Indian ports. It now operates world-wide services. The company own the Houston and Scottish Shire Lines. The combined fleet numbers 58 vessels totalling over 436,000 tons gross.

Clan-na-Gael, name of a secret society formed by Fenians (q.v.) in the U.S.A. about 1883. Its object was to force the Brit. Gov. to give home rule to Ireland (see HOME RULE), an object which the members of the society believed could be achieved by terrorising Parliament and members of the public. The H.Q. of the society was in Chicago, but it had agents in England and Ireland, who were responsible for assassinations and dynamite outrages in the 1880's.

Clanis, see *Chiana*.

Clann na Poblachta, Irish political party, founded in 1946. Its aims include the reintegration of the whole of Ireland as an independent rep., the estab. of a social system based on Christian principles, and the restoration of the Irish language as the spoken language of the people. Until 1957 C. na P. co-operated with other political parties (notably Fine Gael, q.v.) in providing (under the leadership of John A. Costello, q.v.) an alternative gov. to the Fianna Fail gov. of Eamon De Valera (q.v.). In the general election of Mar. 1957 only one C. na P. deputy was returned to the Dail. The leader of the party is Sean Macbriide (q.v.).

Clanvowe, Sir Thomas (fl. 1400), courtier and poet, was a friend of Prince Henry, afterwards Henry V. Prof. Skeat credited him with the authorship of *The Cuckoo and the Nightingale* (written about 1400-1410), a poem which had long been attributed to Chaucer. Wordsworth made a modernised version of it in 68 stanzas (1801).

Clanwilliam, tn. 135 m. NE. of Cape Town in a fertile dist. producing corn and oranges. The gov. cedar forests are near. White pop. 677.

Clapham, dist. in the bor. of Wandsworth, London. C. Common (partly in Battersea) is a recreation ground of 200 ac. Pepys (q.v.) lived mostly in C. after his retirement, and there he d. The station called C. Junction is actually in Battersea.

Clapham Sect, The, name hist. has given to the little coterie of intimate political friends, all humanitarians and all Evangelicals, most of whom lived in the then vil. of Clapham and whose dominant figure was Wm Wilberforce (q.v.). Next most prominent member of this brotherhood of Christian politicians was Henry Thornton (1760-1815), like Wilberforce an independent-minded Tory. The large, lofty, oval-shaped library, designed by the architect Chatham, in Thornton's house was the usual meeting-place of the sect. Wilberforce lived in the house between 1792 and 1797 and for the ensuing 10 years in a house called 'Broomfield,' near Thornton's house. Most of the fraternity

were rich, but they were all generous givers to the poor. The patriarch of the community was Granville Sharp (1735-1813), a much older man than most of the others and almost too poor for a parl. career. He seems to have been the confident and counsellor of the group. Next in seniority and also somewhat apart from the rest was Charles Grant (1764-1823), a servant of the E. India Co. and later chairman of the company's court of directors and M.P. for Inverness-shire. He was father of Lord Glenelg, whose notorious colonial policy owed both its strength and weakness to its inspiration in C. S. ethics. The rest of the group were Zachary Macaulay (1768-1838), father of T. B. Macaulay and a well-known philanthropist, who played a leading part in founding the Brit. colony of Sierra Leone for liberated African slaves; James Stephen (1758-1832), a barrister of St Kitts, who was early a coadjutor with Wilberforce in his abolitionist crusade and an M.P. between 1808 and 1815; Wm Smith (1756-1832), Whig M.P. for Sudbury, Camelford, and Norwich, also an enthusiast for the abolition of the slave trade; the Hon. Edward James Elliot (1759-97), member for Liskeard; John Venn (1759-1813), the preacher and vicar of Clapham at whose par. church, as the tablet there shows, the brethren of the sect congregated for Sunday worship; John Shore (1751-1834); and Lord Teignmouth (q.v.), a great friend of Warren Hastings and later Governor-General of India. Among other intimates, who did not live at Clapham, were the Rev. Isaac Milner, dean of Carlisle (1751-1820) (q.v.); the Rev. Thomas Gisborne, vicar of Yoxall; Thomas Babington, a zealous abolitionist and collaborator with Wilberforce; and Thomas Clarkson (q.v.), the anti-slavery agitator, whose share in the abolition of the slave trade and of slavery was hardly less than that of Wilberforce himself. The fraternity was remarkable for its affinity. It not only lived for the most part in one vil.; it had one character, one mind, and one way of life. All were what Wilberforce meant by 'true Christians,' and many were related by marriage. 'It was doubtless this homogeneity that gave the group its power in public life. They might differ on party issues; but on any question of religion or philanthropy, above all on the tremendous issue of the abolition of the slave trade, the voice of the "Saints" in Parliament or in the press was as the voice of one man.' See R. I. and S. Wilberforce, *Life of Wilberforce*, second ed., 1930; Sir J. Stephen, 'The Clapham Sect,' in *Studies in Ecclesiastical Biography*, 1849; J. S. Harford, *Recollections of Wilberforce*, 1865; J. C. Colquhoun, *William Wilberforce, his Friends and his Times*, 1866; R. Rudolf, *Clapham and the Clapham Sect*, 1927; Sir R. Conpland, *Wilberforce*, 1945.

Clapiers, Luc de, see VAUVENARGUES.

Clapperton, Hugh (1788-1827), explorer, b. Dumfriesshire. He ran away from home at the age of 13 and went to sea. While in the Royal Navy he saw service in the E. and Canada. He accompanied

Dr Oudney and Denham on their exploring expedition by way of Tripoli and Murzuk to Kuka, on Lake Chad, which was reached in 1822, and thence to Sokoto, returning to England in 1825. The results of this expedition had been more of an anthropological than a geographical nature, so in Aug. 1825 a second expedition set out from the bight of Benin to determine the course of the Niger. All the members of this expedition perished save Richard Lander, C. being the last to die, at Changary, near Sokoto.

Clapton, residential dist. of NE. London, in the bor. of Hackney. It was a vil. until the mid 19th cent.

Claque (Fr. *claque*, to clap), body of men hired to applaud in theatres, and thus ensure the success of a play. According to Suetonius, the Emperor Nero had 5000 paid applauders who attended the performances of his plays. From the Rom. origin of the custom, the *claqueurs* are sometimes called *romains*. The C. became an openly organised institution in Paris towards the end of the 18th cent. The leader, upon whom the responsibility rests, is called *entrepreneur de succès dramatique*, and under him are *pleureurs* (weepers), *bisseurs* (who cry bis, or encore), and *rieurs* (laughers), etc. The Théâtre Français and the Grand Opéra, with a few of the leading Parisian theatres, have with more or less success abolished the C. from their houses. A C. existed when ballet was featured at the Alhambra Theatre, Leicester Square, almost up to the time of the First World War, but it was privately engaged by prima ballerinas.

Clare, St. (1191-1233), founder of the order of Poor Clares. She came of a noble family of Assisi; but, through the influence of St Francis, she gave up her wealth and her social life. On his advice she founded her order, the Franciscan order for women, in 1212. St C. was canonised 2 years after death by Pope Alexander IV. See P. Robinson (ed. and trans.), *The Life of St Clare* (ascribed to Thomas of Celano), 1910.

Clare, John (1793-1864), poet, b. Helpstone, near Peterborough. The son of a poor labourer, he has often been called the 'Northamptonshire peasant poet.' At the age of 7 he was employed on a farm, and later received a post as under-gardener, but in 1812 he ran away and joined the militia. For a time he lived with gipsies, then worked as a burner on a lime kiln, but, being dismissed, was obliged to seek for par. relief. C. was fond of learning old songs, and when very young scribbled verses of his own. His inspiration came from Thomson's *Seasons*, and all his poems deal with out-of-door life and farm scenes. *Poems Descriptive of Rural Life and Scenery*, 1820, was well received, and was followed in 1821 by *The Village Minstrel*. C. was helped by men of influence and rank, by whom he was received as a friend, but to the end of his life was poor. *The Shepherd's Calendar*, 1827, and the *Rural Muse*, 1835, were not so successful, though the latter brought him £40 and was praised by Christopher North. He d. in the co.

asylum, Northants, where he composed his last poem, *I am: yet what I am who cares or knows?* See biographies by F. Martin, 1865, and J. W. and A. Tibble, 1932, and especially *Sketches in the Life of John Clare*, written by himself and ed. by E. Blunden, 1930. The fullest and best collection of C.'s poems is by J. W. Tibble, 1935, who also collected his *Letters and Prose* in 1951.

Clare, John Fitzgibbon, 1st Earl of (1749-1802), Lord Chancellor of Ireland after 1789. A barrister and a member of the Irish Parliament, he became Attorney-General. He was an antagonist of Henry Grattan (q.v.), opposed Catholic Emancipation (q.v.), and promoted the Union of Ireland with England. His title became extinct in 1864.

Clare, maritime co. of the Rep. of Ireland, situated between Galway Bay on the N. and the Shannon estuary on the S. To the N. are rugged Atlantic cliffs of Moher and the extraordinary limestone dist. of the Burren, with bare hills, rock-strewn valleys, caves, and underground streams. Lough Derg and the R. Shannon form the E. and S. boundaries. Its length is 67 m. and its greatest breadth 43 m. (average breadth 21 m.). The centre is an undulating plain. The chief ranges of mts are the Slieve Boughda Mts, which lie partly in Galway, and the Slieve Bernagh Mts; the chief rvs. are the Shannon and the Fergus. Oats, potatoes, wheat, and barley are grown, slate and black marble are worked, and the rearing of sheep and cattle is largely carried on. Limestone, lead, and slate are found, and beds of carboniferous limestone. There are as many as 100 small lakes, and many chalybeate springs; the salmon fisheries are important, and in the N. are extensive oyster beds. The chief tns of the co. are Ennis, the cap., Kiltrush, and Kilkee. The co. returns 4 members to the Dail. Area 768,295 ac.; pop. 95,000.

Clare: 1. Tn in Suffolk, England, on the R. Stour, 16 m. from Bury St Edmunds, on the E. Region of Brit. Railways. It has an old castle, formerly the seat of the earls of C., and an Augustinian priory of the 13th cent. Pop. 1400.

2. Tn of S. Australia in Stanley co., chiefly noted for its vineyards and orchards. Pop. 1800.

Clare College, Cambridge, founded as Univ. Hall in 1326 and refounded by Elizabeth de Burgh, Countess of Clare, as Clare Hall in 1338, with statutes in 1359 which provided for the education of priests and scholars to take the place of those who had d. during the Black Death. The present Old Court dates from 1638, and the chapel was consecrated in 1769. The name was changed to C. C. in 1856. The memorial building dates from 1924, and a wing was added in 1955.

Clare Island, 4000 ac., at the mouth of Clew Bay, co. Mayo, Rep. of Ireland. It was the home and H.Q. of Gráinne Uaile (Grace O'Malley), the sea queen of the W. in the 16th cent., who is buried at the local abbey. Pop. 350.

Claremont: 1. Suburb of Cape Town (q.v.). The National Botanical Gardens of S. Africa, in surroundings unsurpassed for grandeur, are approached from here. The municipal gardens contain a famous collection of trees brought together by H. M. Arderne. Sir John Herschel (q.v.) had his observatory at C.; it is now the site of a girls' school.

2. Tn in Sullivan co., New Hampshire, U.S.A., on the Sugar R. and on the Boston and Maine railroad. It manufs. machinery, cotton, and woollen goods, paper, and shoes. Pop. 12,800.

Claremont Park, former royal residence, now within the urb. dist. of Esher, Surrey, England. It was built in 1768 for Lord Clive; later the Princess Charlotte of Wales (d. 1817) and Louis Philippe of France lived there. In 1882 it became the private property of Queen Victoria.

Clarence, Eng. ducal title, sometimes conferred on a younger member of the royal family. It was first held by Lionel (1338-68), the third son of Edward III, in 1362, on the occasion of his marriage to Elizabeth de Burgh. Other notable dukes of C. are Thomas (1389-1421), second son of Henry IV, who d. at the battle of Beaugé; George (1449-78), brother of Edward IV, who d. in the Tower; William IV (1765-1837), previous to his accession; and Albert Victor Christian Edward (1864-92), the eldest son of King Edward VII.

Clarence House, London, residence of H.M. Queen Elizabeth the Queen Mother. It adjoins the W. side of St James's Palace (q.v.) and was built by John Nash in 1825-9 for William IV when he was Duke of Clarence.

Clarenceux, or **Clarencieux**, Eng. heraldic officer, being the first of the 2 prov. kings-of-arms. His jurisdiction lies over England S. of the Trent, and it is his function to inspect the arms of all those who live within his prov. He also grants arms with the sanction of the earl marshal, and in conjunction with his fellow kings.

Clarendon, Edward Hyde, 1st Earl of (1609-74), statesman and historian, b. Dinton, near Salisbury, educ. at Magdalen Hall, Oxford, and called to the Bar in 1625. He was first returned to Parliament in 1640. C. supported the impeachment of Strafford, but as the parl. opposition to Charles I grew more extreme, C. joined Falkland and the moderate Royalists, being chancellor of the exchequer, 1643. After the death of Charles I, C. became one of the prin. advisers of Charles II, and shared his exile. At the Restoration he was created Baron Hyde, and in the following year Earl of C. He had been appointed lord chancellor in 1658, and the appointment was confirmed when the king returned to England. His importance was enhanced by the marriage of his daughter Anne to the Duke of York, heir-presumptive to the throne. As a minister he was unpopular, his rigid Anglican views alienating Catholics and Puritans, his solemnity out of place in the Restoration court. C. was blamed by Royalists for their failure to obtain adequate restitution for their

Civil war losses; and he was held popularly responsible for the failure of the Dutch War. In 1667 the king reluctantly decided to sacrifice C.; he was forced to resign his chancellorship, and in the same year he was impeached, but though the Lords did not convict him, he went abroad, where he remained for the rest of



EDWARD HYDE, LORD CLARENDON

his life. There he finished his *History of the Rebellion*, which was pub. posthumously (1702-4). This is one of the most valuable sources of information on the Civil war period, and contains sev. vivid sketches of the leading personalities of the time; its distinct prejudices do not invalidate its real historical worth. See lives by C. H. Firth, 1909, and H. Craik, 1911.

Clarendon, George William Frederick Villiers, 4th Earl of (1800-70), Eng. statesman and diplomatist. He was ambas. to Madrid in 1833, but returned to England on the death of his uncle (1838), when he succeeded to the title. In 1840 he was made lord privy seal in Melbourne's ministry, and became chancellor of the Duchy of Lancaster. In 1847 he was lord-lieutenant of Ireland, and was foreign secretary 1853-8, 1865-6, and 1868-70. See H. Maxwell, *The Life and Letters of the Fourth Earl of Clarendon*, 1913.

Clarendon, *Constitutions of*, laws, issued in 1164, at the hunting-lodge of C., near Salisbury, by which Henry II proposed to define the temporal powers of the Church in England. The constitutions were 16 in number, among the chief enactments being that titles to eccles. estates and the election of church dignitaries lay within the prov. of the Crown; that clerks found guilty in an eccles. court should be handed over to a secular court for punishment; and that no appeal to Rome could be presented without the consent of the *curia regis*. Becket's refusal to accept

the Constitutions in their written form led to his exile, and, indirectly, to his death. Henry then withdrew the Constitutions. See BECKET, THOMAS.

Clarendon Park, formerly a royal forest, in Wilts, England, 2½ m. from Salisbury. The remains of the royal hunting seat, where Henry II's council enacted the constitutions of Clarendon (1164), may still be seen.

Clarendon Press, former name of the Oxford Univ. Press (q.v.), and the present publishing dept of the Oxford Univ. Press which produces its learned pubs. It was founded in 1672, and had its first home in the upper part of the Sheldonian theatre at Oxford. The name came from the funds being provided by Lord Clarendon's *History of the Rebellion*, the perpetual copyright of which was given to Oxford Univ. by his son. The present Oxford premises of the O. P. in Walton Street were erected by Blore and Robertson in 1825-30. All the subsidiary processes of book production, including Bibles, of which it has the right by royal patent, are done by the firm on its own premises, while paper is supplied by the univ. mills at Wolvercote.

Clarens, vil. of Switzerland in the canton of Vaud, Lake Geneva, 1 m. from Montreux. It has a mild, pleasant climate in winter, and is therefore much frequented by persons suffering from tubercular troubles. Altitude 1245 ft. With other vils. it forms the dist. of Montreux, which has a total pop. of about 15,000.

Clareville, in Trinity Bay, site of the landing of the first transatlantic telephone cable in Sept. 1956, from Oban, Scotland. At C. the cable is joined in a single line to Terrenceville and from there an underwater leg runs to Sydney, Nova Scotia.

Claret, name applied in this country for the last 7 cents. to the red wines of Bordeaux, the Gascon wines which Edward III regarded as such a necessity that he built a fleet to ensure their transport to these is. *Claret* in French refers to a clear light-coloured wine. The vineyards of the Gironde, the Bordeaux region, the greatest wine-producing area in the world, are divided into 4 main groups of first-class importance: Médoc, Graves, Saint-Émilion, and Pomerol. In 1855 the Médoc wines of the first order were divided into 5 classes in order of merit, the first growths being Château Latour, Château Lafite, Château Margaux—Château Haut-Brion, the finest growth of Graves, being allowed to rank with them. At the head of the second growths stands Château Mouton-Rothschild. In Graves Château La Mission-Haut-Brion and Château Pape-Clément come second to Château Haut-Brion. The most famous growths of Saint-Émilion are Château Cheval-Blanc and Château Ausone, and in Pomerol Château Pétrus is the outstanding first growth. The 5 chief wine communes of Médoc are Pauillac, Cantenac, Margaux, St Julien, and St Estèphe. C. is counted by connoisseurs as the most delicate and subtle of all wines, its perfection only

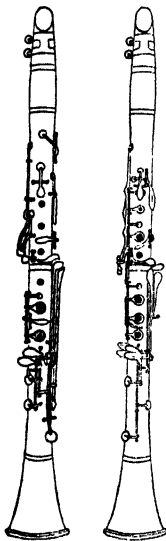
challenged by the very finest growths of Burgundy.

Claretie, Jules (properly **Arsène Arnaud**) (1840-1913), Fr. novelist, playwright, and journalist, *b. Limoges*. He acted as war correspondent during the Franco-Prussian war, became dramatic critic to *L'Opinion Nationale*, 1867, and had great influence as a political writer. His plays of the revolution, *Les Muscadins*, 1874, *Le Régiment de Champagne*, 1877, and *Les Mirabeau*, 1879, were extremely popular. His novels include *L'Assassin*, 1866, *Madeleine Bertin*, 1868, *Le Train 17*, 1877, *Monsieur le Ministre*, 1882, and *Le Prince Zilah*, 1884. He also wrote extensively on historical subjects: *Cinq ans après*, 1877; *Les Prussiens chez eux*, 1872; *La Vie à Paris*, 1896. A complete ed. of his works was pub. 1897-1904.

Clarification, process of refining a liquid by separating or removing the substances which make it turbid. This can be done by straining through a sieve; by using a centrifugal or circular vessel, with a small outlet in the centre, which, when revolved at a high speed, will clear the liquid by lifting the particles of foreign matter to the surface; and by adding to the liquid gelatine, white of eggs, bullocks' blood, etc.

Clarimontium, see CLERMONT-FERRAND.

Clarinet (It. *clarinetto*, from Lat. *clarus*, clear), musical instrument of the wood-



CLARINET

wind family. It is supposed to have been first made about 1700 by Johann Christoph Denner of Nuremberg, who probably developed it out of an earlier Fr. single-reed instrument, the chalumeau—the word chalumeau is still used to define the lowest part of the compass of the C. The C. consists essentially of a mouthpiece furnished with a single beating reed—i.e. a reed which vibrates against an air-slot in the mouthpiece—a cylindrical tube ending in a bell, and provided with 18 openings in the side, half of which are closed by the fingers and half by the keys. The reed is made from a thin slip of a Sp. reed (*Arundo donax*) and is kept in place on a flat-tened table by means of a ligature. Since the reed at one end of the tube serves to close it at that end, the pipe acts as a 'stopped' one, sounding an octave lower than an open one, which explains why the pitch of the C. differs from that of the flute. In orchestral music 2 instruments

are usually employed, namely A pitch and Bb—the C pitch instrument, to be observed in the scores of 'classical' composers, is now very rare, but the smaller Eb C. is used where high and rather shrill notes are required. In military bands, the C.s used are Bb and Eb. Some notable orchestras evidently did not use C.s until towards the close of the 18th cent., e.g. the Viennese court orchestra, and it is to Mozart's fondness for the instrument, which he first used at Mannheim and Paris in 1777-8, that is owed the earliest notably artistic treatment of it. His symphony in Eb major, concerto and C. quintet exemplify his love of the instrument. Weber also showed great fondness for the C. and after that time 2 C.s of the normal size became a *sine qua non* of every orchestra. There are various other instruments of the C. family: high Eb, which is pitched a perfect fourth above the Bb instrument; the alto C. in Eb, and F, a military band instrument now superseded by the saxophone; and the basset horn. This last, which in appearance is like the bass C., is in fact a tenor instrument, its pitch being an octave lower than that of the obsolete C. of C pitch. The bass C., in Bb, is fairly regularly used in the modern orchestra.

Clarion: 1. A shrill-sounding trumpet, not now in use, formerly employed as a signal to arms.

2. An organ stop, having pipes with reeds, which give a piercing sound like that of a C.

3. A heraldic bearing.

Clarium, see CHIARI.

Clark, Charles Heber, see ADELER, MAX.

Clark, Edwin Charles (1835-1917), barrister, *b. near Shrewsbury*, and graduated at Trinity College, Cambridge, of which he became fellow. Subsequently he was appointed regius prof. of civil law at Cambridge. Author of *Early Roman Law: Regal Period*, 1872, *An Analysis of Criminal Liability*, 1880, *Practical Jurisprudence*, 1883, *Cambridge Legal Studies*, 1888, and *History of Roman Private Law*, vol. 1, 1906.

Clark, Francis Edward (1851-1927), Amer. clergyman (originally surnamed Symmes), *b. Aylmer in Quebec, Canada*. He became pastor of a Congregational church at Portland, Maine, in 1876, where he founded (1881) the Young People's Society of Christian Endeavour. He was editor or honorary editor of the *Christian Endeavour World* from 1886 until his death, and president of the United Society (1887-1925). He travelled round the world 5 times, and wrote many books, including *Our Journey Around the World*, 1894, and *World-wide Endeavour*, 1895. See also CHRISTIAN ENDEAVOUR.

Clark, George Rogers (1752-1818), Amer. frontier general, *b. Albemarle co., Virginia*; educ. at a common school. Explored the region W. of the Alleghenies in 1772; practised as a surveyor; engaged in many encounters with the Indians on the Ohio R. in 'Dunmore's war.' Removed to Kentucky (then a mere dist.) in 1776 and became one of its delegates

to the Virginia legislature. In the War of Independence he defeated Lt.-Governor Henry Hamilton, 1779, at Fort Sackville; for this and similar services C. received a grant of land from the U.S. Gov. He took part in the Fr. operations against Spain in the Mississippi valley. He d. in poverty near Louisville, Kentucky. See lives by W. Harghurst, 1952, and J. C. Nolan, 1954.

Clark, John Bates (1847-1938), Amer. economist, b. Providence, Rhode Is. He studied at the Univs. of Heidelberg and Zürich, and was appointed prof. of political economy and hist. at Columbia Univ. in 1895. Works: *The Philosophy of Wealth*, 1885; *Capital and its Earnings*, 1888; *Wages*, 1889; *The Control of Trusts*, 1901; *The Distribution of Wealth*, 1901; *The Problem of Monopoly*, 1904; *Essentials of Economic Theory*, 1907; *The Modern Distributive Process*, with F. H. Giddings, 1909; *Control of Trusts*, enlarged ed., with his son J. M. Clark, 1912.

Clark, Josiah Latimer (1822-98), engineer, b. Great Marlow, Bucks. He took a junior position on the construction of the Britannia tubular bridge, after which he became assistant engineer to the Electric Telegraph Co., with which he remained till 1870. He worked out the system of enclosing underground wires by means of gutta-percha coating, of sending messages by the pneumatic tube, and invented the double-cap invert insulator and the C. cell. He also made investigations with regard to submarine cables and invented C.'s compound, a mixture of asphalt, hemp, and silica, with which such cables are now covered. The practice now in use of stamping telegrams and of registering abbreviations for cablegrams originated from a suggestion by C. He pub. sev. works, including *Electrical Tables and Formulae*, 1871, and a *Dictionary of Metric and Other Useful Measures*, 1891.

Clark, Thomas (1799-1868), publisher, b. Edinburgh, and founder, 1821, of the firm of T. & T. Clark. He took his nephew Thomas (later Sir Thomas) C. into partnership in 1846. The business, which specialises in theology, philosophy, and law, still flourishes under the control of the C. family.

Clark, William Tierney (1783-1852), civil engineer, b. Bristol. He became chief engineer to the W. Middx. Waterworks, and constructed the Thames and Medway Canal, the Hammersmith suspension bridge (1824-7), and the suspension bridge over the Danube at Budapest (1839-49).

Clarke, Adam (1762-1832), Wesleyan Methodist preacher, b. co. Londonderry. He brought out a *Bibliographical Dictionary*, 1802-6, in 8 vols., but his chief work was a *Commentary on the Bible* (8 vols.), 1810-26. He also wrote *Memoirs of the Wesley Family*, 1823. His biography entitled *Account of the Infancy, Religious, and Literary Life of Adam Clarke*, 1833, is in 3 vols., the first being autobiographical (religious life), and the other two by his daughter. Consult also the life written by Etheridge, 1858.

Clarke, Charles Cowden (1787-1877), critic, b. Enfield, Middx. He was an intimate friend of the Shelley group. His lectures on Shakespeare, delivered in London during the years 1834-54, made him famous. His wife Mary Victoria (1809-98)(q.v.), daughter of V. Novello, compiled a complete *Concordance to Shakespeare*, 1844-5. Joint productions of the husband and wife included an annotated ed. of Shakespeare, 1869, *The Shakespeare Key, unlocking the Treasures of his Style*, 1879, and *Recollections of Writers*, 1873. C. also pub. *Tales from Chaucer in Prose*, 1833, and *Shakespeare Characters, chiefly those Subordinate*, 1863. See M. V. C. Clarke, *Centennial Biographic Sketch of Charles Cowden Clarke*, 1887, and R. D. Altick, *The Cowden Clarkes*, 1948.

Clarke, Edward Daniel (1769-1822), traveller and mineralogist, b. Willington, Sussex. After having graduated at Cambridge (1790) he accompanied Cripps on a tour through Europe, Egypt, and Asia Minor (1799-1802), from which he brought back the colossal statue of the Eleusinian Ceres, now in the Fitzwilliam Museum. He was appointed prof. of mineralogy at Cambridge in 1808. He pub. his *Travels in Various Countries of Europe, Asia, Africa*, 1810-23, and *Greek Marbles brought from the Shores of the Euxine Archipelago and Mediterranean*, 1809. See W. Otter, *Edward Daniel Clarke: Life and Remains*, 1825.

Clarke, Sir Edward George (1841-1931), barrister, eldest son of J. G. C., a London jeweller. Educ. City of London College, King's College evening classes. He was a writer in the India Office, 1859-60, and Tancred law student, 1861, and was called to the Bar 3 years later. He sat in Parliament, representing Southwark (1880), Plymouth (1880-1900), and City of London (Jan.-June 1906). In 1886, during Lord Salisbury's ministry, he was appointed solicitor-general and knighted. The chief cases that he was connected with in his legal career were the Penge case (1877), the Bartlett case (1886), the Baccarat case (1891), and the Jameson case (1896). His pubs. include a *Treatise on the Law of Extradition*, 1866 (4th ed. 1903), *Public Speeches*, 1888-90 and 1890-1900, *Selected Speeches*, 1908, *Easy Shorthand*, 1907, *The Story of my Life*, 1918, and *Benjamin Disraeli, the Romance of a Great Career*, 1926.

Clarke, Sir George Sydenham, see SYDENHAM OF COMBE, LORD.

Clarke, James Freeman (1810-88), Amer. Unitarian minister, b. Hanover, New Hampshire, U.S.A. He graduated at Harvard, 1829, and at the Harvard Divinity School, 1833. He took part in the founding of the Unitarian Church of the Disciples in Boston (1841), to which he acted as pastor (1841-50 and 1854-88). He was appointed prof. of natural religion and Christian doctrine (1867-71) and lecturer on ethnic religions (1876-7) in Harvard Univ. C. was a keen advocate of the anti-slavery cause, and a voluminous writer. His works include *Campaign of 1812*, 1848, *Eleven Weeks in Europe*, 1852, *The Christian Doctrine of*

Forgiveness of Sin, 1852, *Orthodoxy*, 1866, *Steps of Belief*, 1870, *Ten Great Religions*, 1871-83, *Self-Culture*, 1882, *The Ideas of the Apostle Paul translated into their Modern Equivalents*, 1884, *Manual of Unitarian Belief*, 1884, *Anti-Slavery Days*, 1884, and *Vexed Questions*, 1886. See his *Autobiography, Diary, and Correspondence*, ed. by E. E. Hale, 1891.

Clarke, Jeremiah (1673 or 1674-1707), Eng. organist and composer, b. perhaps at Windsor, became a choirboy in the Chapel Royal under Blow, was organist at Winchester College in 1692-5 and then at St Paul's Cathedral in London from the year 1697, where the unfinished building was ready for services. He shot himself in a fit of mental derangement on 1 Dec. 1707. C. wrote church, theatre, choral, and keyboard music. The so-called *Trumpet Voluntary*, wrongly attributed to Purcell, is one of C.'s marches for the harpsichord, *The Prince of Denmark's March*, described as a 'trumpet tune' because the melody is constructed on the natural scale of the trumpet.

Clarke, Marcus Andrew Hislop (1846-1881), Australian writer, b. Kensington. He was educ. at Highgate School, emigrated to Victoria at the age of 18, and entered upon a journalistic career, writing under the pseudonym Peripatetic Philosopher. His best work is a novel on the cruelties of the life in a prison settlement, *For the Term of his Natural Life*, pub. in 1874. Among his other works are *Long Odds*, 1869, *Holiday Peak*, 1873, and *History of the Continent of Australia, 1787-1870*, 1877.

Clarke, Mary Victoria Cowden (1809-98), wife of Charles Cowden C. (q.v.). She was a pupil and a friend of Mary Lamb. In addition to the works written with her husband she pub. *The Complete Concordance to Shakespeare*, 1844-5; *The Girlhood of Shakespeare's Heroines*, 1850; *The Iron Cousin*, a novel, 1854; *World-noted Women*, 1858; a biography of her husband, 1887; and *My Long Life*, 1896.

Clarke, Samuel (1675-1729), divine and philosopher, b. Norwich. He could not agree with the theories of Descartes in vogue at the time, and accordingly became a follower of his friend Newton. In 1706 Queen Anne chose him as her chaplain, and in 1709 appointed him to the rectory of St James, Westminster. His treatise *The Scripture Doctrine of the Trinity*, 1712, in which he stated that the doctrine of the Trinity was not held by the early Church, was considered semi-Arian, and C. was brought before Convocation. His famous discussion with Leibnitz as to the relation of time and space to God was undertaken by request of the Princess of Wales, and the papers were pub. in 1717. C. delivered the Boyle lectures in 1704-5, choosing for his subject *The Being and Attributes of God*. C. won a very high reputation as a philosopher, and in the sphere of metaphysics was regarded as second only to Locke. Other essays of his to be noted are *A Discourse concerning the Unalterable Obligations of Natural Religion*, 1708, and *A Philosophical Inquiry concerning*

Human Liberty, 1715. See the life by B. Hoadly, prefixed to the collected ed. of his works, 1738-42, and W. Whiston, *Memoirs of Clarke*, 1741.

Clarke, William Branwhite (1798-1878), geologist, b. E. Bergholt, Suffolk. In 1840 he went out to Australia and became vicar of a church in Willoughby, New S. Wales, 1847-70. He discovered gold in Australia in 1841, tin in 1849, and diamonds in 1850. He carried on valuable investigations, wrote many scientific papers, and obtained the Murchison medal from the Royal Geographical Society in 1877.

Clarkia, genus of N. Amer. ann. herbs, family Oenotheraceae, of which *C. elegans* and *C. pulchella* and their strains are popular garden flowers.

Clarksburg, city in W. Virginia, the heart of a bituminous coal region, with natural gas deposits. It manufs. stone, clay, carbon, and glass products, tin plate, chemicals, precision instruments, clothing, and lumber, food, and paper products. Pop. 32,014.

Clarkson, Thomas (1760-1846), anti-slavery agitator. In 1785 he won a prize for his Lat. essay, *An liceat involos in servitutem dare?*, of which his Eng. trans. (1786) had a very large sale. From this time he worked to bring about the abolition of African slavery by speaking in the chief towns of England and in Paris, and by issuing pamphlets. In 1807 the Bill for the abolition of the slave trade became law, on which occasion Wordsworth wrote his sonnet, *Clarkson, it was an obstinate hill to climb*, and in 1808 C. himself pub. *The History of the Rise, Progress, and Accomplishment of the Abolition of the African Slave Trade*. He was active in founding an Anti-Slavery Society (1823), the object of which—to suppress slavery in the W. Indies—was accomplished by the passing of the Emancipation Bill in 1833. In his latter years he founded institutions for sailors at seaports, and did philanthropic work. His essays include *On the Slavery and Commerce of the Human Species* (his trans. of the Lat. essay mentioned above, 1786) and *The Cries of Africa to the Inhabitants of Europe*, 1822. See CLAPHAM SECT.

Clarksville, city in Tennessee, U.S.A., cap. of Montgomery co., 10 in. NW. of Nashville, is a railway centre and has an important trade in tobacco and a snuff factory. Pop. 16,246.

Clarus Mons, see under CLERMONT-FERRAND.

Classical Association, The, founded in London, 1903, with the object of impressing upon public opinion the claim of classical studies to an eminent place in the national scheme of education. This aim is maintained by organising conferences and public lectures, both through a central organisation and through 28 local branches, by encouraging research, and by improving the practice of school teaching by free discussion of methods. The association arranges prize competitions among schools for the reading of Latin and Greek aloud. The H.Q. of the

association are at the London Univ. Institute of Classical Studies, 50 Bedford Square, London, W.C.1. Its chief pubs. are *Classical Review* (quarterly), *Classical Quarterly* (thrice yearly), *Greece and Rome* (thrice yearly), and *Proceedings* (ann.). See L. J. D. Richardson, 'The Classical Association—The First Fifty Years' in *Jubilee Addresses*, 1954.

Classical Economists, academics and men of affairs, philosophers and economists, Englishmen and Scotsmen who over the cent. between 1750 and 1850 formulated the principles of the new science of economics and the theory of economic policy to which it led. They were David Hume, Adam Smith, David Ricardo, Thomas Malthus, Robert Torrens, Nassau Senior, John McCulloch, James Mill, John Stuart Mill, Jeremy Bentham, and John Elliot Cairnes. For many years historians and political theorists represented them as the apologists of pauperism and profits, the tools of capitalist exploiters, opponents of social reform, and men who conceived no other function for the State but that of the night watchman. In recent years this view has been challenged.

It is true that the dominant impression given by the writings of the C. E. may be that they were opposed to governmental action in principle and in favour of complete freedom in economic activity. But this is because they were essentially reformers writing to expose the defects of the restrictive mercantilist institutions and habits of thought which lingered from the 17th and 18th cents. They were concerned with current political controversies, and were addressing themselves not to posterity but to their contemporaries. It was natural, therefore, that they should emphasise the liberating aspect of their theories.

But it is an error to suppose that this is the sum content of their teachings. Their works show that they contemplated not *laissez-faire* in the common sense of non-interference by gov. in economic activity, but an active state in which man-made laws and institutions enabled the market economy to work to the social advantage.

Thus Adam Smith spoke of '... the duty of erecting and maintaining certain public works and certain public institutions, which it can never be for the interest of any individual or small number of individuals to erect and maintain; because the profit could never repay the expense to any individual or small number of individuals, though it may frequently do much more than repay it to a great society.' Jeremy Bentham endeavoured to erect a structure of institutions which so co-ordinated action as to create the good society. His *Constitutional Code* provided for a cabinet with ministers for elections, legislation, army, navy, preventive services (police, fire, etc.), interior communications, indigence, relief, education, domain, health, foreign relations, trade, and finance. These were to be served by administrative machinery envisaged in full detail. The

president of the Board of Trade, for example, was instructed to bear in mind the need to revise regulations following changes in the value of money produced by changes in its supply relatively to the quantity of goods. (In this respect, at least, we have yet to catch up with the C. E.) McCulloch, Senior, J. S. Mill, and other C. E. discussed the functions of the State in a 'liberal' society.

Furthermore, where it was not possible to perfect the framework of laws and institutions so that spontaneous activities promoted the general interest, e.g. where competition was not practicable, the C. E. envisaged direct State intervention. Adam Smith favoured assistance for infant industries; J. S. Mill advocated assistance for backward peoples, an upper limit on inheritance, and a tax on the increment of land values; McCulloch argued for limitation of the dividends of public utility companies. These and other 'interferences' were designed to fit into the system of economic freedom in order to increase opportunities and knowledge or reduce excessive power so that the market economy worked for the good of the community.

Nor is the familiar picture of the attitude of the Classical Economist to social conditions borne out by their writings. Smith and Malthus wanted subsidised schools. Senior (in the Report on the Handloom Weavers) said: '... both the ground landlord and the speculating builder ought to be compelled by law ... to take measures which shall prevent the towns they create being centres of disease.' With one exception, all the C. E. opposed truck. (Ricardo thought that Robert Owen's experiment at New Lanark might benefit from a truck shop.) The C. E. supported the Factory Act restrictions on the employment of children. Senior favoured restrictions on the employment of women in mines. Although some of the C. E. thought that most women should be treated as being as responsible as men, it was because, J. S. Mill urged, it would allow them access to industrial employment as a means of emancipation. Torrens wanted compensation for handloom weavers displaced by machinery. (In 1956 the question of compensation for workers displaced by automation became a live political issue.)

The C. E. were generally opposed to minimum wage-fixing, not because they wished to depress wages but because they considered the demand for labour might diminish. Most of them supported trade unionism, but not without misgivings about the effects on the workers. J. S. Mill wrote: 'There must be some better mode of sharing the fruits of human productive power than by diminishing their amount. Yet this is not only the effect but the intention of many of the conditions imposed by some unions on workmen and on employers. All restrictions on the employment of machinery, or on arrangements for economising labour, deserve this censure. Some of the union regulations go even further than to

prohibit improvements; they are contrived for the express purpose of making work inefficient; they positively prevent the workmen from working hard and well. . . . This is a judgment which many could dispassionately pass on trends in mid-19th-cent. trade unionism.

The strength of the C. E. was that they made realistic assumptions about man and the world he inhabits. These were two; first, that man sought his own interest (and this did not mean self-interest but the interest of any whom he chose to benefit by his efforts); second, that while the world was getting richer, it was still poor and that all had to be given incentives to contribute to the common good. Hence the need for machinery that would gear self-interest to the social advantage. The record of the 19th and 20th cents. suggests that no system known to man or conceived by him, except a market economy, can, in modern industrial society, achieve these objectives and leave man to live out his life in freedom. The C. E. must be judged not from the interpretations of others, but from their own writings; and from the experience of those who have ignored or learned from their teachings. See also INDIVIDUALISM. See W. H. Hutt, *Economists and the Public*, 1936, and Lionel C. Robbins, *The Theory of Economic Policy in English Classical Political Economy*, 1952, and Robert Torrens and the *Evolution of Classical Economics*, 1958.

Classics. The term derived through Fr. *classique* from Lat. *classicus*, which was first used by Aulus Gellius (2nd cent. AD) to denote a writer of the highest class. In due course it was applied to the works of such authors; hence we speak of a 'classic' when referring to a book of acknowledged excellence or recognised authority. To-day classic is used most commonly with reference to the literatures (including sometimes the histories and languages) of ancient Greece and Rome (qq.v.). Modern classical scholarship begins with the Renaissance, although much work on Gk literature had already been done by the Alexandrian scholars (e.g. Aristarchus of Samothrace, and Aristophanes of Byzantium, qq.v.), who in the 3rd cent. BC classified the texts that were then extant. After the Renaissance, scholarship was naturally intent on going over the newly discovered treasures of classical literature. The printing of the C. in Italy in the 16th cent.—which was an event in itself—made classical study an integral part of the humanistic education, advocated by such a man as Erasmus (q.v.). The founder of historical criticism was the younger Scaliger (q.v., 1540-1609), who was also an adept at textual emendation, and his methods were inherited by the 2 great Eng. scholars of the 18th cent., Bentley and Porson (qq.v.). In the 19th cent. scholarship in the hands of the Ger. scholars (see BEKKER, I.; BOECKH, A.; DINDORF, W.; HERMANN, G.; MOMMSEN, T.; WOLF, F. A.) was mostly devoted to the editing and collating of the classical

texts, while in England the Porsonian tradition passed from Cambridge to Oxford in the person of Elmsley (q.v., 1773-1825). In Victorian England scholarship was marked by such names as G. Grote, R. C. Jebb, J. E. Sandys, J. Burnet (qq.v.), and by the great lexicons of Liddell and Scott (Greek), and Lewis and Short (Lat.). In the U.S.A. during the 19th cent. classical studies became of increasing importance, represented at Harvard by the Lat. scholar Lane, and at Yale by the Gk scholar Seymour. An Amer. school was founded at Athens in 1881 and a Brit. school 2 years later. Since then archaeology has been a stimulus to modern scholarship, which in recent years has been actively fostered by societies both in England and America, and this in spite of the fact that the value of a classical education has been called in question.

Classification, see STATISTICS.

Classification (Lat. *classis*, a class), name given to the process whereby a number of objects which are alike in one or more respects are collected under a common name. Systematic C. is essential to any science; artificial C. is the name given to a collection of facts for some special purpose, such as statistics of various kinds. Each science has its own system of C., but the problem which has engaged the minds of scientists and philosophers from very early times is that of the relation of sciences to each other—that is, the C. of sciences as a whole. Of the many attempts made in this direction, those of Bacon, Comte, and Spencer may be briefly outlined as being representative of various views. Bacon's C. was based on a subjective criterion of the various faculties which are concerned in the study of different sciences. Hist. is, according to this theory, the science of memory, philosophy that of reason, etc. Comte's C. was based on an objective criterion; all sciences pass through 3 stages, according to him—theological, metaphysical, and positive. Of the positive sciences mathematics is the lowest, sociology the highest. Spencer classified sciences under 3 heads, as abstract, such as logic, etc.; abstract concrete, such as physics, mechanics, etc.; and as concrete, such as astronomy, sociology, etc. It is obvious that no system of C. inspired by a pre-conceived theory can be wholly satisfactory. See also CATALOGUES AND CLASSIFICATION, and CLASSIFICATION, PLANT.

Classification, Plant, naming and grouping of members of the plant kingdom in such a way that those most nearly related in form and structure are placed together, and so that, as far as possible, the order of their appearance in the world and their natural origins are made evident. The arrangement of plants into their related groups is termed Systematics, and their naming and description concern Taxonomy. The system of modern botanical C. was founded by Carl Linnaeus, the Swedish botanist, on a binomial basis, whereby each plant is given a generic and specific name in Latin, common to

botanists of all countries. The grouping of plants is necessarily artificial and amenable in the light of discovery and a more certain knowledge of plant affinities and evolution, compelling name changes.

In present-day C. plants may be divided in 2 main groups as: (1) rootless, non-vascular plants with or without simple leaves, reproduced usually by spores; and (2) plants with roots, vascular, with stem and leaf; or in 4 groups or subcommunities: (1) Thallophyta, the Thallophytes; (2) Bryophyta, Mosses, and Liverworts; (3) Pteridophyta, Ferns, and their allies; and (4) Spermatophyta, the Spermophytes or seed- or flower-plants. These groups are split into divs. (Algae, Bacteria, Fungi, Diatoms, Charophytes, Liverworts, Mosses, Ferns, Club Mosses, Horsetails, Gymnospermae, and Angiospermae) which are often themselves grouped into sub-divs. Divs. and sub-divs. are divided into classes, and sometimes subclasses; i.e. the div. Angiospermae has 2 classes. Monocotyledonae and Dicotyledonae, of which the latter has 2 subclasses, Archichlamydeae and Metachlamydeae. The classes are divided into orders (often ending in -ales), and the larger orders into suborders (ending in -neae). Orders (or suborders) are divided into families, usually ending in -aceae, with exceptions in Compositae, Gramineae, and Labiatae. Families are divided into subfamilies with names terminating in -oideae; and again into tribes, usually ending in -eae, and subtribes, ending in -inae. In their turn these groups are divided into genera (sing. genus), which give us the first name of an individual plant, and a large genus may sometimes be split into subgenera. The genus is divided into species, which give the second epithet of a plant's botanical name. The species may be divided into subspecies, and again into varieties, and sometimes races, forms, or clones, the last being individual plants which have definite characteristics propagated by vegetative means. Under species may also be placed hybrids, plants derived from the cross-fertilisation of one species with another.

Classis, see RAVENNA.

Clathrate Compounds, see INERT GASES.

Claude of Lorraine (1600-82) properly called Claude Gellée, Fr. landscape painter, b. Châtenay, Lorraine. Being left an orphan at the age of 12, he went to live with an elder brother, a wood-carver at Freiburg, and when still a boy travelled in Italy. At Rome he received employment in artists' studios, and was fortunate in coming under the notice of Agostino Tassi, the landscape painter, who gave him lessons. He may also have studied under Gottfried Waals at Naples, and finally settled in Rome in 1627. Not long after he attracted the attention of Cardinal Bentivoglio, who procured him an introduction to Pope Urban VIII, and a commission for 2 paintings: 'La Fête Villageoise,' and 'Un Port de mer au soleil couchant,' now in the Louvre. C.'s pictures commanded high prices even during his lifetime (Clement IX offered for 'Villa Madama' as many pieces of

gold as could cover the canvas), and he was troubled with many forgers. Accordingly, he kept sketches of his pictures in paper books, which he called his *Liber Veritatis*. These were afterwards engraved by Earlom; the originals belong to the Duke of Devonshire. C. excelled as a landscape painter. His colouring is very delicate and harmonious, and perhaps no other painter has so well represented the radiance of a morning or evening sky. He was not so adept in figure-drawing, in which he sometimes



CLAUDE OF LORRAINE

Engraving after a painting in the Royale, Paris.

received help from fellow artists, and is supposed to have once said that he sold the landscape and gave away the figures free. His landscapes number about 400, and are to be found in all the chief galleries of Europe. His drawings are distinct from his paintings in their directness, and magnificent examples are in the Brit. Museum. Consult Ruskin, *Modern Painters*, 1843-60; Mrs Mark Pattison, *Claude Lorraine, sa vie et ses œuvres*, 1884; A. M. Hind, *The Drawings of Claude Lorrain*, 1925; P. Courthion, *Claude Gellée, dit le Lorrain*, 1932.

Claude, Jean (1619-87), Fr. Protestant preacher and controversialist, pastor at Charenton (1666-85), who on the revocation of the Edict of Nantes fled to Holland. His works include *Défense de la réformation* (4 vols.), 1671, and *Réponse à la conférence de Bossuet*, 1681.

Clausel, Paul Louis Charles (1868-1955), Fr. poet, dramatist, and essayist, b. Ville-neuve-sur-Fère. He filled many consular posts, and was Fr. ambas. to Japan, to the U.S.A. (1927-33), and to Belgium (1933-1935). But he is chiefly known to fame as one of the greatest Catholic writers of France. His dramas take place in time

rather than in space, the drama being one of the salvation or destruction of the soul. His prin. dramas are *Tête d'or*, 1889; *L'Annonce faite à Marie*, originally written as *La Jeune Fille Violaine*, 1910; *L'Otage*, 1918; *Le Soulier de satin*, 1920. His prin. poetic works are *Cinq Grandes Odes*, 1911, *Corona benivolentis anni Dei*, 1915, and *Poèmes de guerre*, 1922. Other pubs.: *Feuilles de saints*, 1925, *Les Éuménides d'Eschyle*, 1920, and *Conversation dans le Loir-et-Cher*, 1937. A synthetic and obscure writer, he adopted a form of verse recalling that of the Psalms. C.'s place in the literary firmament is both eminent and questioned. Some derive a novel aesthetic and spiritual experience from his drama and, to a less degree, from his verse, while others are unmoved. Yet no other modern verse is at once so cosmic and yet personal, for it is the fruit of C.'s preoccupation with his own spiritual salvation, written without much regard for the contemporary world. His metrical ingenuity is marked and, like T. S. Eliot, he is skilful in the use of long unrhymed periods. C.'s plays are by no means easily adaptable to ordinary stage requirements. A less-known play is *Partage de Midi*, written in the Far E. in 1906. Yet it is regarded by the critics as one of his greatest works. He became a member of the Fr. Academy in 1946.

Claudia Celea, see **CELJE**.

Claudianus, **Claudius** (Claudian) (d. c. AD 408), Lat. poet, b. Alexandria. His native tongue was Greek, but he acquired a perfect command over Latin. In 395 he gained the favour of Stilicho, whom he eulogised in his *De Laudibus Stilichonis* (3 books). His other writings are *Raptus Proserpinae*, an epic poem; *Gigantomachia*, a fragment; *De Bello Gothico*; and sev. occasional poems and panegyrics. After the Gothic war, he was honoured by the Senate with a bronze statue in the forum of Trajan. His poems are vivid and written in a somewhat ornamental style. The best ods. are those of Th. Birt, 1892; J. Koch, 1895, and M. Platnauer (with trans., Loeb Library (2 vols.), 1922. See T. Hodgkin, *Claudian: the Last of the Roman Poets*, 1875, and J. W. Mackail, *Latin Literature*, 1895.

Claudius I, Rom. emperor (AD 41-54), whose full name was Tiberius Claudius Drusus Nero; son of Drusus Nero and nephew of the Emperor Tiberius, b. Lugdunum (Lyons) in 10 BC. He was sickly and neglected as a child; but despite undoubted eccentricity, he was not, as is commonly alleged, an imbecile. On the assassination of Caligula in AD 41, C. was proclaimed emperor by the praetorian guards. In the first years of his reign the imperial boundaries were extended, and a foothold secured in Britain (43). At Rome he built 2 aqueducts, and constructed a new harbour at Ostia. But C.'s reign as a whole was marred by the influence of 2 freedmen, Pallas and Narcissus, as well as by the evil genius of 2 wives, Messalina and Agrippina the younger (qq.v.). C. d. by poison, which, according to Tacitus, was administered by

Agrippina; and his subsequent deification is satirised in Seneca's *Apocolocyntosis*. See V. M. Saramuzza, *The Emperor Claudius*, 1940.

Claudius II (Marcus Aurelius Claudius), surnamed Gothicus, Rom. emperor AD 268-70. He was b. in Illyricum of a family of no note, but distinguished himself in military service and was made governor of his native prov. under Valerian. On the death of Gallienus, the army proclaimed C. emperor. He defeated the Alemanni in the N. of Italy (268); and won a great victory over the Goths near Naissus, in Dardania, on which occasion he received his surname Gothicus. He d. at Sirmium in Pannonia.

Claudius, **Appius**, surnamed **Cæcus**, Rom. censor, to which office he was elected in 312 BC, without having previously been consul. He retained it for 4 years, though according to Rom. law no man might be censor for longer than 18 months. He was supposed to have become blind, hence his name **Cæcus**. He built the Appian aqueduct, which brought water to Rome from Tusculum, and began the construction of the Via Appia. In the war with Pyrrhus, the terms of peace, drawn up by Cincæus, were rejected by the Senate largely because of Appius's spirited opposition to them. C. was consul in 307 and 296 BC.

Claudius, **Appius Sabinus Regillensis**, Sabine of the tn of Regillum, where he was known as Attus Clausus; founder of the gens Claudia. About 504 BC he settled in Rome, where he was admitted to patrician rank. He became consul in 495, and the enmity he displayed towards the plebeians led to their secession to the Mons Sacer in the following year. The Sabines who accompanied him to Rome were given lands by the Anio.

Claudius, **Publius**, surnamed **Pulcher**, generally known as **Clodius** (d. 52 BC), Rom. profligate and politician. After a chequered military career in the E., he returned to Rome in 65 BC. In 62 he entered the house of Julius Caesar and profaned the mysteries of the Bona Dea, which were being celebrated by Pompeia, Caesar's wife, and other Rom. matrons. Clodius was brought to trial in the following year, but by corrupting the judges he obtained an acquittal. Cicero had given evidence at the trial, for which Clodius never forgave him. He descended from patrician rank, and was adopted into a plebeian family that he might become a tribune of the plebeians. He was chosen tribune in 58, and used his influence to banish Cicero from Rome on the grounds that the latter had unlawfully punished the adherents of Catiline with death. In 56 C. was aedile. He was murdered in Jan. 52, on the Appian road, by the supporters of his enemy Milo (q.v.).

Claudius Albinus, see **CLODIUS**.

Claus, **Emile** (1849-1924), Flem. painter, popular for his studies of children and open-air scenes. Examples of his works are in the galleries of many of the chief tns of Europe.

Claus, **Santa**, see **CHRISTMAS** and **NICHOLAS**, **St.**

Clausel, or **Clauzel**, **Bertrand**, Count (1772-1842), Fr. soldier and marshal of France. He distinguished himself with the army in Naples, Dalmatia, and Portugal. In 1813 he was almost daily engaged with the English during the retreat of the French before Wellington into France. He was exiled in 1815, after he had opposed the troops of the Duchess of Angoulême during the Hundred Days, but returned in 1820. He was made a marshal by Louis Philippe and Governor of Algeria. He was commander-in-chief of the African Army until the check sustained before Constantine caused his recall in 1836.

Clausen, **Sir George** (1852-1944), painter, son of a decorative artist of Dan. extraction, was b. London. Went to the National Art School (now Royal College of Art). Studied under Bouguereau and Robert Fleury, with whom, however, his work has nothing in common. He was permanently influenced by Millet, Corot, and Manet, as was evident in the paintings which he exhibited at Burlington House in the seventies, pictures of country life and landscape full of life and movement. His best paintings were always the fruit of a deep study of country life—of landscape in sun and shade, of flowers, of work on the farm. His picture 'The Girl at the Gate' was bought by the trustees of the Chantrey Bequest for the nation and may be seen in the Tate Gallery. His pictures render excellently the appearance of things in brilliant sunshine and various open-air conditions. Of his landscapes in this kind 'The Gleaners Returning' in the Academy of 1908 was also bought by the Chantrey Bequest. Barn interiors, paintings of the nude, and still-life compositions were other characteristic subjects. His portraits include that of himself at the Fitzwilliam Museum, Cambridge, in water-colours. A.R.A., in 1895, R.A. in 1908, knighted in 1927. Pub. *Six Lectures on Painting and Aims and Ideals in Art*.

Clauswitz, **Karl von** (1780-1831), celebrated Prussian general and writer on theory and tactics of warfare, b. Burg. He served with Prussia from 1792, being engaged in the campaigns of the Rhine, 1793-4, and attending the Berlin school for young officers, 1801-3, where he won the favour of Scharnhorst. In the campaign of 1806 he attended Prince Augustus as adjutant, and was taken prisoner with him at the capitulation of Prenzlau. After his exchange, he was major on the general staff till 1812. In that year he entered the Russian service, in which he remained till 1814, having been Russian staff officer with Blücher's campaign of 1813. He returned into Prussian service. In all his campaigns he distinguished himself by his intelligence and resource. He was made chief of a Prussian army corps in 1815, and in 1818 was made major-general and a director of army schools and an inspector of artillery. It is, however, from his writings on the theory of warfare that he is most famous. His best-known work, his great book on war in 3 vols., entitled *Vom Kriege*, 1832, was an epoch-making work in regard to

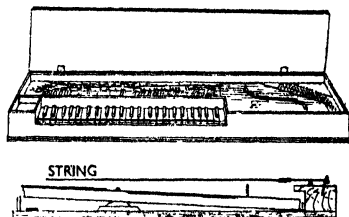
the subjects of which it treats. He also wrote *Der Feldzug von 1796 in Italien*; *Der Feldzug von 1813*, 1813; *Über das Leben und den Charakter von Scharnhorst*, 1832.

Clausius, **Rudolf Julius Emmanuel** (1822-88), Ger. physicist, b. Köslin, Pomerania. He taught for 12 years at the Federal Polytechnikum at Zurich. Thermodynamics was the science to which he gave special study and, in a lesser degree, optics and electricity. He earned the credit of being the founder of thermodynamics as a science; and, by his statement of Carnot's principle (see THERMODYNAMICS) he put the theory of heat on a sounder basis. He developed the kinetic theory of gases (1857), following the earlier work of Joule (q.v., and THERMODYNAMICS). C. calculated the average velocities of the molecules and the average distance through which they move in a straight line between collisions. He was awarded the Copley medal of the Royal Society in 1879. Among his numerous works may be mentioned *On the Nature of Heat, compared to Light and Sound*, 1857, and *Mechanical Theory of Heat*, 1864-7.

Clausthal-Zellerfeld, Ger. tn in the Land of Lower Saxony (q.v.), 50 m. SE. by S. of Hanover (q.v.). It is in an important mining dist. (lead, iron, silver, copper, zinc) in the Harz Mts. Pop. 17,000.

Clavagella, or **Club-shell**, lamellibranch typical of the family Clavagellidae, to which belongs also the well-known mollusc *Aspergillum*. They usually live in corals and rocks.

Claverhouse, see **DUNDEE, VISCOUNT**.



CLAVICHORD

Above is the typical clavichord; and below, a theoretical diagram of the action on a larger scale.

Clavichord, musical instrument, one of the stringed keyboard instruments which preceded the pianoforte. The strings were not plucked, as in the harpsichord, but struck by brass tangents projecting from the ends of the keys. It was far less powerful and brilliant than the harpsichord, but more expressive, as the force could be controlled by the player's touch.

Clavicle (from Lat. *clavis*, key), bone commonly known as the collar-bone. It is connected at its inner end with the sternum or breastbone, and at its outer or scapular end with the shoulder-blade,

together with which it forms the arm socket. In animals it is shorter than in man, where it is a long bone shaped like an S and lying nearly horizontal. The bone is easily fractured or dislocated, but can be fairly easily returned to its place and pieced together when the arm is supported. The merry-thought, or wish-bone, of a fowl is composed of the 2 C.s.

Clavicornes (Lat. *clava*, club; *cornu*, horn), name given by Latreille to those coleopterous insects in the section Pentamera which have their antennae thickened at the apex and thus resemble a club in shape. Burying-beetles and bacon-beetles belong to the group.

Clavie, Burning the, an ant Scottish custom, once more widely distributed, but now only kept up at Burghhead, a small fishing vil. on the Moray Firth. The custom takes its name from the Lat. word *clavis*, a nail, as a bonfire is first made of split casks, one of which is then joined together again by large nails. The cask is then filled with tar, ignited, and carried round the vil. up to a headland where there are the remains of a Rom. altar; the assembled people scramble to get a piece of the C. with which to light their New Year's fire, and the charcoal of the C. is put up the chimneys, as it is supposed to prevent witches and evil spirits from descending. The date of this old custom is 12 Jan., the old New Year's Day.

Clavijero, Francisco Xavier (c. 1720-1787), Sp.-Mexican historian, b. Veracruz, Mexico. Pub. in Italian *Storia Antica del Messico*, Cesena (4 vols.), 1780-1. It was trans. into English by Cullen in 1787. C. also wrote *Storia della California*, Venice, 1789.

Clavijo y Fajardo, Don José (1730-1806), Sp. publicist and naturalist, b. in the Canaries. He was challenged to a duel by Beaumarchais, whose sister he had jilted. He trans. Buffon's *Histoire Naturelle* in 1785-90, for which he was rewarded by being appointed director of the Natural Hist. Museum in Madrid. Goethe (q.v.) drew largely on C.'s story for his *Clavigo*, 1774.

Clavius, Christopher (1537-1612), Ger. Jesuit priest and mathematician, who was employed by Pope Gregory XIII to superintend the reformation of the calendar. In 1612 he compiled a treatise on the construction and use of sundials.

Claws, term applied in zoology to various sharp appendages on the limbs of different animals, and frequently they are not homologous. The sharp nails of a vertebrate, the chelipeds of a lobster, and the chelicerae of a scorpion are all termed C. In vertebrates they are formed of hardened and thickened epidermal tissue, and in the cat they are retractile, i.e. they can be drawn in and thrust out at will.

Clay, Alfred Borron (1831-68), painter. He attended the Royal Academy school, 1852, and exhibited historical pictures, 1854-68. Among his works may be mentioned 'The Return to Whitehall, 29 May 1660,' 1867, now at Liverpool, and

'Imprisonment of Mary Queen of Scots at Lochleven Castle,' 1861.

Clay, Cassius Marcellus (1810-1903), Amer. politician, b. in Madison co., Kentucky, and educ. at Centre College, Danville, and at Yale Univ. He was passionately opposed to slavery, and spent much of his energy opposing it; as a result of his sympathies he made many enemies. He was U.S. minister to Russia, 1861-9. In 1872 he was one of the organisers of the Liberal Republican revolt, and took a prominent part in politics until he retired.

Clay, Frederic (1838-89), musical composer, the son of James C., the famous authority on whist. He studied music at Paris, where he was b., under W. B. Molique, and under Hauptmann at Leipzig. His works include a number of operettas, but he was best known by his songs, 'I'll sing thee songs of Araby' (from a cantata setting of Moore's *Lalla Rookh*), 'She wandered down the mountain side,' and 'The Sands of Dee.'

Clay, Henry (1777-1852), Amer. statesman and lawyer, b. in Virginia. Called to the Bar at an early age, after an indifferent education, he quickly distinguished himself as an advocate. In 1803, to fill an unexpired term, he was elected member of the Kentucky legislature, in 1806 and 1810 of the U.S. Senate, and in 1811 of Congress, becoming speaker of that body. His fiery speeches did much to bring about the war of 1812, and in 1814 he represented the U.S.A. at Ghent in the peace negotiations with Great Britain. He thrice unsuccessfully contested the presidency: first in 1824, when he lost to Adams, and again in 1832 to President Jackson, and in 1844 to Polk. In 1825 Adams made him secretary of state. After a period of retirement from politics he again entered the Senate (1831), and till his death retained all his old influence either there or as an adviser of the Whigs. In his foreign policy he warmly espoused the cause of the S. Amer. reps. in their struggle for independence. His objective was that the U.S.A. should recognise the reps. as such, and accordingly, after the rising in Spain in 1820, he moved in Congress an appropriation for sending ministers to these reps. His resolution was defeated, but he followed it up by another in 1821, expressing the sympathy of the people of the U.S.A. with the struggle of the reps. to throw off the Sp. yoke. This was passed, but not until the Sp. treaty of 1819 respecting the boundaries of the Floridas and Texas and other ter. had been ratified by Spain, when the resolution could hardly prejudice Amer. interests. His name will ever be stamped on Amer. economic hist. by reason of his part in the development of the Amer. system of protection of manuf. goods by tariffs, and the fostering of internal improvements by state grants or loans. C. came out as a protectionist during the nullification campaign of 1832-3 (see NULLIFICATION), when he astounded his followers by introducing a new Tariff Bill in which he proposed to reduce all existing duties to

an *ad valorem* basis of 20 per cent. such duties as exceeded that rate to be gradually diminished over a period of 10 years, when the rate should become uniform. The Bill, which was a mere compromise, was passed mainly to appease S. Carolina; but in his subsequent speeches it is clear C. was for a protectionist policy on general grounds of political expediency, viz. that the European nations had adopted the system, that it was necessary to create a home market for agriculture so as to keep pace with the rapid increase in Amer. power of production; and that a compact system of home manufs. made for union among the states. He advocated a convertible paper currency, demanded state assistance in the development of rail and water communications, and effected a compromise between the slave states and the Abolitionists (see on this COMPROMISE MEASURES of 1850). His many successful efforts to bring about national harmony gained him the sobriquets of 'the Great Compromiser' or 'the Great Pacifier.' See C. Colton (ed.), *Works of Henry Clay*, 1883.

Clay, name applied indefinitely to the finer waste matter arising from the decomposition of rocks. C. is distinguished by its ductility and tenacity, and consists mainly of alumina and silica with a small quantity of water. It is rarely found in a pure state except where rocks containing felspar have decomposed, and is used chiefly in the manuf. of bricks.

Clay Cross, urb. dist. of Derbyshire, England, 5½ m. SE. of Chesterfield, centre of an extensive coal- and iron-field. Pop. 8550.

Clay Ironstone, name given to the ore from which iron is smelted, in particular the carbonate (siderite) which occurs mixed with clay. In common with blackband ironstone, the ore is found chiefly in beds composed of small balls or nodules, and fossils are frequently met with embedded in the plastic substance. Before smelting, C. I. is usually subjected to roasting for a period of a month or so—the ore being broken up for this purpose—and during this time it loses from one-quarter to one-third of its weight. The method of smelting adopted is, in most cases, that of the blast furnace. Analysis has demonstrated that C. I. contains a large number of impurities, but the 2 chief constituents are ferrous oxide (about 40 per cent) and carbonic acid (about 25 per cent). The total metallic iron present averages 30 per cent. The condition in which this is present (ferric or ferrous) depends on the extent to which the processes of oxidation and hydration have been carried by the atmosphere. Ironstone in some form or other is found in practically all the coalfields of Great Britain, generally in convenient proximity to the limestone, which then forms its fuel. The earthy nature of the ore renders the addition of calcareous fuel necessary before it can be properly smelted, and the convenient distribution of ironstone and limestone referred to has formed a big factor in the industrial development of Great Britain.

Clay Pigeon, see PIGEON SHOOTING.

Clay Soils derive their specific character from the hydrated silicates of alumina which are found in them, both in a state of mixture and in chemical combination. China clay or kaolin is a very pure form of one such silicate. When farmers speak of a clay soil, they mean an intractable earth, which, when dry, becomes baked as hard as a brick, and which in its wet state is so sticky as to resist all efforts to work it with ordinary agric. implements. A pure clay soil would be quite infertile, but its felspars are almost always composed partly of lime, potash, and soda, which render the soil amenable to cultivation. As they hold water, are cold, and fairly impervious to air, C. S. are unsuitable for building purposes.

Claymore (Gaelic *claidheamh mor*, great sword), two-handed sword of the Scottish highlanders. The guard (quillon) often ends in an open quatrefoil. The name is quite incorrectly given to the single-handed basket-hilted broadsword, which was frequently single-edged. These are still carried by the officers of Scottish regiments in the Brit. Army.

Clays, Paul Jean (1819-1900), Belgian painter of the school of Willem and Leys. Among his best-known pictures are 'Calm in Zealand,' 'The Open North Sea,' 'A Squall on the Scheldt,' and 'Dutch Boats in the Flushing Roads.'

Clayton, John Middleton (1796-1856), Amer. politician, was b. Dagsborough, in Sussex co., Delaware. He was engaged in politics from a comparatively early age, and sat in U.S. Senate 1826-30, 1845-9, and again from 1852 till his death. He is chiefly known by his negotiation of the C.-Bulwer Treaty (q.v.), when he was secretary of state in 1850. He d. at Dover in Delaware.

Clayton, Robert (1695-1758), Irish bishop, whose motion in 1756 in the Irish House of Lords, for the expunging of the Athanasian and Nicæan Creeds from the liturgy, gave great offence. The feeling against him was increased by his pub. of *A Vindication of the Old and New Testament* in 1757. C. was threatened with a legal prosecution, but d. before the proceedings opened.

Clayton, see MANCHESTER.

Clayton, city, cap. of St Louis co., Missouri, U.S.A., at W. of St Louis. It is a farm trade centre with dairy and textile products. Pop. 16,000.

Clayton-Bulwer Treaty, between Great Britain and the U.S.A., was so called from the names of the statesmen representing the respective countries. The U.S.A. was represented by J. M. Clayton, Great Britain by Sir Henry Bulwer. By the terms of the treaty both parties pledged themselves to respect the neutrality of the proposed ship canal across Central America. Between 1880 and 1884 the gov. of the U.S.A. put forward sev. reasons why it might, when it thought fit, withdraw from its contract. These reasons, it may be stated, could not be reconciled with any system of law, national or international. The C.-B. T., which was concluded at Washington

on 19 April and ratified on 4 July 1850, was abrogated in 1901 by the Hay-Pauncefote Treaty (q.v.), which embraced the neutrality rule for the Panama Canal.

Clayton-le-Moors, par. and tn of Lancs, England, in the div. of Accrington, from which it is distant 1½ m. It is situated on the Leeds and Liverpool Canal, and engineering, brick-making, cotton and blanket weaving, and soap-making are carried on. Pop. 6817.

Clazomenae (modern Kelisman), anct tn of Ionia, and a member of the Ionian Confederation of Twelve Cities, or Dodecapolis. The inhab., alarmed by the Persian invasions, removed to one of the small is. of the bay from an isthmus which connected the mainland to a peninsula. Alexander the Great built a pier to the mainland, and the remains are still visible. It was the bp. of Anaxagoras, and is famous for the terra-cotta sarcophagi found there.

Cleaning, see HOUSEWIFERY.

Cleanthes (331-232 BC), Stoic philosopher, the successor of Zeno of Citium, was b. Assos, in the Troad. He attended the lectures of Zeno for 19 years, and, in order to obtain money to pay his class fee, he used to draw water for the gardens about Athens and to grind corn at night. On the death of his teacher, C. became the recognised head of the Stoic school (263), and was himself succeeded by his pupil, Chrysippus. He wrote many treatises, but the only work of his that is extant is a beautiful *Hymn to Zeus* which is among the most important evidences of Gk religious thought. He d. of voluntary starvation. See A. C. Pearson, *The Fragments of Zeus and Cleanthes*, 1891.

Clear Island, small is. in the co. of Cork, Rep. of Ireland, about 4 m. from Baltimore, with an area of only 1504 ac. The chief occupation is fishing. Cape Clear is the most southerly point of Ireland. Pop. 665.

Clear-story, see CLERESTORY.

Clearance and Redevelopment (Housing). The Housing Act, 1957, deals with the subject under 2 headings, C. and R., in Sections 42 to 75.

I. CLEARANCE AREAS. The machinery for dealing with clearance areas is the same, initially, as it was under the Housing Act, 1930, and then under the Housing Act, 1936. There was no change under the Housing Repairs and Rents Act, 1954. Local authorities have been required to submit to the minister a 5-year programme for dealing with this problem.

A *clearance area* is one in which all the properties therein have to be demolished, although 'islands' of satisfactory property may be excluded. The area must contain more than one building of which at least one must be a dwelling-house. Houses may be included in a clearance area not only on grounds of being unfit for human habitation but also (and this applies to other buildings as well as houses) because by reason of their bad arrangement or the narrowness or bad arrangement of the streets they are dangerous or injurious to the health of

the inhab. of the area. 'Other buildings,' such as workshops and factories, might, therefore, be included because they obstruct the free admission of light and air into the neighbouring houses. Bad internal arrangement within a house is not one of the factors set out in the Housing Act, 1957. It may well be a factor for consideration when, it having been determined that a house is unfit, the next problem is what is the most satisfactory method of dealing with the conditions.

The local authority may act on information in its possession and must have regard to a written official representation from the Medical Officer of Health, who must make such a representation upon complaint of a Justice of the Peace or at least 4 local gov. electors. The local authority must discover if: (1) The most satisfactory method of dealing with the conditions in the area is the demolition of all buildings. (2) Suitable accommodation for the persons displaced is, or will be, available—and provide or secure it, as far as it does not exist in advance of displacement. (3) Its resources are sufficient for the purpose of carrying its decisions into effect.

Clearance orders. It is the duty of the local authority to implement its resolution in one of two ways or partly in one and partly in the other, viz.: (1) by issuing a clearance order, under which the owner is himself required to demolish the buildings; or (2) by issuing a compulsory purchase order, under which the local authority acquires and demolishes the buildings. The local authority may acquire a site cleared by owners if not developed by them after 18 months.

The Housing Repairs and Rents Act, 1954, enabled the local authority to include in a clearance order, in respect of any house which can provide a standard of accommodation adequate for the time being and of which it has or will acquire a tenancy before the order becomes operative, a provision postponing demolition until after it has determined it is no longer required for housing purposes. Owners must be given at least 6 weeks to demolish, and 28 days' notice must be given to the occupiers to vacate. In the case of houses subject to a compulsory purchase order, demolition may be delayed in the case of any house capable of providing a standard of accommodation adequate for the time being. The local authority may retain any other house belonging to it if either it is required for the support of a house which is being retained for housing purposes or there is some other special reason connected with these purposes for its retention. It may also acquire a house for any such purpose which is subject to a clearance order. On completion of the purchase the clearance order ceases to have effect.

Treatment of a clearance area. The authority must, as soon as possible, cause every building to be vacated and either: (a) demolish the same within 6 weeks or a reasonable extension and thereafter sell

or let the land or, subject to ministerial approval, appropriate it for an authorised purpose, or (b) sell or let the land subject to a condition that the buildings be demolished forthwith and to such restrictions and conditions as it thinks fit.

The London Co. Council and the Metropolitan Bor. Councils are the authorities concerned with clearance areas in London. Where an official representation relating to not more than 10 houses is made to the co. council it must forward it to the bor. council affected unless it considers that the area should be dealt with by itself.

II. REDEVELOPMENT AREAS. The local authority may pass a resolution declaring to be a proposed redevelopment area any area in its dist. in which the following conditions are found on inspection to exist: (a) that the area contains 50 or more working-class houses; (b) that at least one-third of the working-class houses in the area are (i) overcrowded, or (ii) unfit for human habitation, and (iii) not capable at a reasonable expense of being rendered so fit, or (iv) so arranged as to be congested; (c) that the industrial and social conditions of the dist. are such that the area should be used to a substantial extent for housing the working-classes; and (d) that it is expedient in connection with the provision of housing accommodation for the working-classes that the area should be redeveloped as a whole.

Within 6 months after a local authority has passed such a resolution, or within such extended period as the minister may allow, the authority must prepare and submit to the minister a redevelopment plan indicating (i) the land intended to be used for the provision of houses for the working-classes, for streets, for open spaces, and (ii) generally the manner in which it is proposed that the defined area should be laid out. In the preparation of the plan the local authority must have regard to the provisions of any development plan relating to the defined area or land in the neighbourhood. After a specified period the local authority must acquire all land in respect of which it has not been able to make arrangements with other persons for the carrying out of the redevelopment plan.

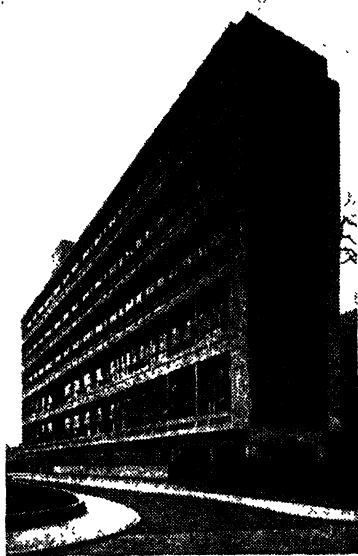
The local authority for redevelopment areas in London (other than the City) is generally the London Co. Council, but there are arrangements whereby the Metropolitan Bor. Council for the area may act.

GENERAL PROVISIONS AS TO CLEARANCE AND REDEVELOPMENT. The compensation in respect of land purchased compulsorily is assessed in accordance with the Acquisition of Land (Assessment of Compensation) Act, 1919. Land which surrounds or adjoins a clearance area is acquired at market value either by agreement or compulsorily if necessary to implement a scheme. Land belonging to the local authority may be appropriated for the purpose.

The minister or a local authority is obliged to state reasons for deciding that

a building is unfit if there has been objection to the order; and an objector must appear at the local inquiry to be entitled to a written statement from the minister. A clearance area having been declared, and a clearance order or a compulsory order made, a notice must be served on all owners who object on the grounds that the houses are not unfit, setting out the prin. grounds on which the local authority is satisfied as to unfitness.

A special payment may be made by a local authority on the direction of the



London County Council

MAISONETTE BLOCK, LOUGHBOROUGH ROAD

minister to the owner of a house which, in spite of being unfit, has been well maintained.

A local authority may, by order, with the approval of the minister, extinguish any public right of way over any land included in C. or R. areas.

Slum Clearance (Compensation) Act, 1956. Compensation in respect of land purchased compulsorily under Part III of the Housing Act, 1957, is paid generally at site value only for insanitary property as the buildings are considered worthless. Market value is paid for land and buildings acquired because of bad arrangement or narrowness or bad arrangement of streets, or merely by reason of disrepair or sanitary defects. Market value is also paid for land acquired either by agreement or compulsorily because it surrounds or adjoins a clearance area and is reasonably necessary to implement the scheme.

During the severe housing shortage many people purchased houses which were unfit for occupation and which, but for this Act, are due to be acquired at site value under slum clearance schemes. This Act provides additional compensation to these owner-occupiers who bought between 1 Sept. 1939 and 13 Dec. 1955, and who were in residence on the latter date. If the house is purchased compulsorily within the next 10 years as being unfit, compensation will be paid at the same rate as if it were not unfit. The house must be vacated under a clearance order, closing order, or demolition order. Under certain exceptional circumstances, the provisions apply even if the house was vacated before 13 Dec. 1955, such as through a posting as a member of the armed forces of the Crown. The courts have power to discharge or modify any liabilities where the interest in a house covered by the above provisions is subject to mortgage or similar charge. Occupiers of business premises in unfit houses compulsorily acquired may receive compensation on the basis stated above.

Clearances. The dispossession of the crofters of the Scottish highlands, dating from 1750, by landowners who introduced sheep-rearing. This led to a considerable emigration to N. America.

Clearchus. Spartan general of the 5th cent. BC. After commanding a portion of the fleet in the battle of Cyzicus, he was sent as harpoon to Byzantium, but so infuriated the people by his despotism that the inhab. opened the gates to Alcibiades. He assisted the young Prince Cyrus against Artaxerxes. He received the command-in-chief of the Greeks after the battle of Cunaxa, and directed the retreat of the Ten Thousand, until he was led into an ambush by Tissaphernes, and delivered to Artaxerxes, who put him to death in 401 BC. *See also* TEN THOUSAND, EXPEDITION OF THE.

Clearing-houses, institutions estab. by bankers for the adjustment of mutual claims for cheques and bills, by exchanging them and settling the balances. The London bankers' clearing-house was estab. by the prin. bankers in London in 1770. There are 2 clearings, the balance being struck only at the afternoon clearing. Clerks representing the different banks first go to the clearing-house for the purpose of getting 'in' clearings entered (i.e. drafts against their banks); they then return to their offices so that the 'out-books' there may be cast and sent down to the clearing-house to be checked against the 'in-books' of other banks. The London bankers' clearing-house enables the claims of the member banks to be set off against each other, only the balance of account (e.g. cheques) being met by a transfer of funds at the Bank of England. *See also* BANKS AND BANKING.

Clearing Nut, seed of a tree (*Strychnos potatorum*) of the family Loganiaceae. The fruit is a single seed enveloped in pulp. The people of India use it for scouring the inside of their pots before filling them with water from rivs. or ponds, the impurities in the water sinking

to the bottom as a result of the albumen and casein in the seed.

Clearwater, city, cap. of Pinellas co., on the W. coast of Florida, U.S.A., 20 m. W. of Tampa, a winter resort with orchards and market gardens and fisheries. Pop. 15,580.

Cleat, nautical term for a double hook used for making ropes fast without tying them by a knot. They are of different shapes, and are placed in various parts of a boat. A thumb C. is a small piece of wood affixed to a spar so that a rope can be bent around it. A comb C. resembles a small double-arched bridge.

Cleator, vil. of SW. Cumberland, England, in the Ennerdale (q.v.) rural dist. The par. church incorporates Norman work, and the Rom. Catholic church was designed by Pugin in Gothic style. Near by on C. moor is a prehistoric stone circle. Pop (with C. Moor) 6411.

Cleavage, property of some minerals and rocks whereby they split readily in a predetermined direction. In minerals the orientation of the C.s is determined by the atomic structure of the crystals. In some minerals the ions are bound into sheets, chains, or groups which are linked together by weaker bonds. Such minerals cleave by parting along the weak planes, and the shape of the C. fragments depends on the pattern of the ions. Rock salt splits into cubes, calcite into rhombs and micas, which possess an extremely good C., into flakes of microscopic thickness.

In rocks C. is due to quite different causes. It is produced by the parallel alignment of flaky or tabular minerals in finely crystalline metamorphic rocks. C. of this kind is best developed in slates, which are derived from argillaceous rocks and which are rich in flaky micaceous minerals. The parallel orientation of these minerals is due to the effect of strong pressures in the earth's crust during their growth. The rocks split into thin sheets suitable for roofing, etc.

Cleavers, or Goose-grass, *Gallium aparine*, ann. wayside weed of the Rubiaceae. Has small white flowers and bristly purple fruits which cling to wool or fur.

Cleburne, city of Texas, U.S.A., the cap. of Johnson co., situated 55 m. SW. of Dallas. Pop. 12,900.

Cleckheaton, par. and tn in the urb. dist. of Spenborough (q.v.), Yorks, England. The tn has a very fine iron and machine-making; there are collieries in the dist. The par. has an area of 1756 ac. Pop. 11,312.

Clee Hills, range of hills situated in S. Shropshire, which rise here and there into fairly high peaks, of which the chief are Brown Clee Hill (1792 ft) and Titterstone Clee Hill (1750 ft). There is some coal in the dist., and a noted hard rock called Dlu stone is quarried in large quantities.

Cleethorpes, watering-place of Lincs. England, adjacent to Great Grimsby, on a flat, sandy beach at the mouth of the Humber, here over 7 m. wide. There is a sea wall of nearly a mile in length, and a promenade and marine embankment about 3 m. in length. C. is connected

with Grimsby by train and bus. Pop. 31,000.

Clef, in music, a character placed at the beginning of the staff to determine the pitch and name of the notes. In modern notation there are 3 clefs: the G, or treble clef, placed on the second line; the C clef, placed on the third or fourth line (alto or tenor clef respectively); and the F, or bass clef, placed on the fourth line. The C clef could formerly be used on any line, but only as the soprano clef, with C on the bottom line of the staff, was it as frequent as the alto and tenor position.

Cleft Palate, congenital failure of development in the roof of the mouth, resulting in a fissure which may extend along the middle line of the hard palate and soft palate as far as the uvula. The reason for such lack of development is not known; it is often hereditary and frequently associated with hare-lip, where the upper lip is divided on one side, or on both sides, of the middle line. The condition, whether of C. P., or hare-lip, or both combined, is one dangerous to the welfare of the child, as swallowing is rendered difficult and sucking is rendered impossible, or results in the return of the milk through the nasal passages. In later years an additional disability is sustained through the impossibility of rendering some of the elements of speech, and the senses of taste, smell, and hearing may be considerably impaired. These considerations make an operation advisable. If hare-lip exists, the gap should also be closed by surgical operation. Advances in plastic surgery have enabled modern surgical treatment of this condition to bring about splendid cures. The cosmetic effect is such as to render the deformity practically, or even absolutely, invisible as the child grows older.

Cleg, dipterous insect of the family Tabanidae with delicately spotted wings. The larvae, which are carnivorous, feed on earthworms and insect larvae.

Cleisthenes (fl. 508 bc), Athenian reformer, the son of Megacles and Agariste, and grandson of Cleisthenes, the tyrant of Sicyon. He was the leader of the Alcmaeonidae, and after the expulsion of the Pisistratidae (510 bc), headed the democratic party. He was opposed by the whole party of nobles, and in particular by Hippas and Isagoras, the former of whom he expelled in accordance with the Delphic oracle. C.'s chief reforms were (1) the abolition of the 4 ancient tribes and the substitution of 10 new ones; (2) the introduction of ostracism, by which a party leader might be got rid of without resorting to bloodshed; (3) the re-establishment of election by lot. Isagoras called in the help of the Spartans, and for a time C. was obliged to withdraw from Athens; but Isagoras was ultimately defeated, and C. was recalled and his laws confirmed.

Cleitus, see CLITUS.

Cleland, William (c. 1661-89), Scottish soldier and poet, was brought up on the estate of the Marquess of Douglas, to whom his father was gamekeeper. He joined the Covenanters, with whom he

fought at Drumclog and Bothwell Bridge. Later he was agent for William of Orange, and was made lieutenant-colonel of the Cameronian regiment which defended Dunkeld; he was killed there.

Cleland, small tn of Lanarkshire, Scotland, on S. Calder Water, situated 3 m. N.E. of Motherwell. There are collieries and iron works. Pop. (including the small suburb Ormca), 2848.

Clematis, genus of about 240 species of Ranunculaceae; herbaceous and woody plants, with opposite leaves, mostly climbing by means of their petioles, widely distributed in temperate regions of N. and S. hemispheres. Flowers vary from solitary to paniculate, with 4, sometimes 8, sepals, many stamens; fruits are achenes in large heads, with persistent styles, often plumose with silky hairs. *C. vitalba*, Traveller's Joy or Old Man's Beard, is found in England on calcareous soils. Climbing C. grown in gardens include hybrids and varieties of the large-flowered *C. florida*, greenish-white, *C. lanuginosa*, white, both of China, *C. patens*, violet, Japan, and C. × *jackmanii*, a hybrid of *C. lanuginosa* × *C. viticella*; and the small-flowered *C. armandii*, evergreen, white, China, *C. alpina*, blue, Europe, *C. montana*, white, Himalaya, *C. viticella*, purple, SE. Europe, and *C. tangutica*, yellow, China. *C. crispa*, fragrant, bluish-purple, U.S.A., and other minor species are popularly called Virgin's Bower.

Clemence Isaure, Fr. poetess, b. near Toulouse towards the early part of the 15th cent. Guillaume Benoît, a jurist of the 15th cent., ascribes to her the *Jeux floraux*, held at Toulouse on 3 May, although her existence has been called in doubt by others. There is a statue of her at Toulouse and another in the Jardin du Luxembourg, Paris.

Clemenceau, Georges Eugène Benjamin (1841-1929), Fr. statesman, b. Fesle, the son of a doctor of strongly republican views. C. studied medicine, first at Nantes and then in Paris, where he took his degree. At the univ. he was a fire-brand republican, noted for his polemics against Bonapartism. Later, C. went to the U.S.A. to study Amer. sociological conditions, maintaining himself by teaching in a young ladies' school in Connecticut. He married one of his pupils, a Miss Mary Plummer. On his return to France, he set up practice in Montmartre, and became prominent during the revolution of 1870 at which period he was mayor of Montmartre and a deputy for Paris at the national assembly at Bordeaux. Here, he voted against making peace with Prussia. By 1876, as the representative of Paris in the Deputies, his biting eloquence marked him out as the outstanding radical spokesman. Thenceforth he was essentially the destroying force in Fr. politics, overthrowing with mordant wit and unflinching energy one gov. after another. He brought about the fall of the Gambetta Cabinet in 1882, that of Ferry in 1885, and that of Brisson in 1886. He also played a leading role in the fall of Boulanger. In 1893, defeated

in the election, he took to journalism, collaborating in the editing of the *Echo de Paris*, *Figaro*, and other journals, and starting his own paper, *La Justice*. He was chief editor of *L'Aurore* in 1897 during the famous period of his journalistic activities when he headed the campaign in favour of Dreyfus (q.v.).

He became senator for the Var in 1903. In the Radical struggle against the Catholic Church, he succeeded Sarrien as premier, but in 1909, after 3 years of office his gov. was defeated after a violent debate in which he accused Delcasse of

resistance to Ger. aggression, and, at the end, an unforgiving victor. While in opposition, he was a bitter critic of the administrative shortcomings of successive Fr. war govts. Finally, in 1917, came the formation of the Victory Cabinet under C.'s celebrated slogan 'Je combattrai devant Paris. Je combattrai derrière Paris.' In Mar. 1918, during the dark days of the final Ger. offensive, he supported Milner in the decision to appoint Foch as generalissimo of the allied armies. After the war he presided and directed the proceedings at the Peace Conference in Paris in 1919, where he was tenacious of Fr. security. His enthusiastic support for the allied policy of fostering the growth of new or enlarged states in Central and E. Europe, was actuated chiefly by the desire to create buffer states against Germany, whereas Wilson and Lloyd George were concerned rather with removing causes of friction by the application of the principle of self-determination. C. persuaded both President Wilson and Lloyd George to sign treaties binding their nations to aid France against unprovoked aggression, but the treaties lapsed through the refusal of the Amer. Senate to ratify. In conveying to the Ger. representatives the terms of the treaty, which he did in a few curt words, C. permitted no oral discussion. His subsequent reply to the written Ger. observations was a brilliant document, the purport of which was that no peace could be founded on a condonation of the war which Germany had brought about and that reparation by Germany was a *sine qua non* of justice. During the conference in Feb. 1919, an unsuccessful attempt was made on his life. In 1920 he resigned from the premiership, was nominated for the presidency, but withdrew his candidature, and after travelling abroad, settled at his home in La Vendée and devoted his remaining years to his literary work.

C. became known as 'The Tiger' for his political vehemence in the days before he became an international figure, and the sobriquet remained for the rest of his life. He was one of the outstanding political figures of the war period, his inspiration and energy doing much to sustain Fr. resistance at a time when national morale was low. It has been well said of him that, like Foch, he fired the soul of France and steered her will. His pub. works include *Grandeurs et misères d'une victoire* (memoirs), 1929, and *Au soir de la pensée* (on philosophy and morals), 1927 (trans. *In the Evening of my Thought*, 1929). See also Clemenceau: the Events of his Life as told by himself to his former secretary, Jean Martel, trans. by M. Waldman, 1930; G. Adam, *The Tiger: Georges Clemenceau, 1841-1929*, 1930; G. Braun, *Clemenceau*, 1943; J. H. Jackson, *Clemenceau and the Third Republic*, 1946.

Clemens, Samuel Langhorne (1835-1910), Amer. novelist and humorist, better known by his pen-name Mark Twain, b. Florida, Missouri, son of a lawyer. His education was cut short when his father



Topical Press

GEORGES CLEMENCEAU

humiliating France in the Algeiras affair (q.v.). But his gov. had been generally successful; he had done much in the way of social reform, but had ruled labour with firmness, as was proved during the strike of miners in the Pas-de-Calais in 1906, when he showed the iron hand by employing the military. Thereby C. alienated the sympathy of the Socialist party, but he had emerged as the strong man of France, a role which he was destined to repeat in the First World War with most dramatic effect. He had, besides, greatly enhanced Fr. prestige abroad, especially by his firm attitude towards Germany. His desire to redress the wrong done by Germany over Alsace-Lorraine was lifelong.

His early political career is distinguished by its iconoclasm and preoccupation with inter-party warfare. It was the First World War which made C. a national, almost legendary figure, the symbol of Fr.

d. in 1847, and he was apprenticed to a printer and wrote articles for his brother Orion, who ran the *Missouri Courier*. As a journeyman printer he travelled E. to New York and Philadelphia. In 1857 he became an apprentice pilot on the Mississippi, where he remained till the river boats stopped running on the outbreak of the Civil war. After 2 weeks as a second lieutenant in the Confederate volunteers he went back to journalism, and as city editor of the Virginia City, Nevada, *Enterprise* first used the pseudonym Mark Twain, the call of the pilots when taking soundings, meaning 2 fathoms. A meeting with Artemus Ward (q.v.) gave him greater literary ambitions, and later he collaborated with Bret Harte (q.v.). In 1865 his story 'The Celebrated Jumping Frog of Calaveras County' was pub. in a New York paper and made him a famous humorist.

He was now commissioned by the Sacramento Union as a writer of travel articles, sent first to Hawaii and then told to go round the world. Instead, he joined a party going to the Mediterranean and wrote *The Innocents Abroad*, 1869, a debunking account of the trip, which estab. him as a writer of note. Returning to America he married Olivia Langdon, who belonged to a wealthy New York family, and they lived at Hartford from 1871 to 1891. This was the happiest time of his life, during which he wrote his most famous books, *The Adventures of Tom Sawyer*, 1876, *A Tramp Abroad*, 1880, *Life on the Mississippi*, 1883, *The Adventures of Huckleberry Finn*, 1884, and *A Connecticut Yankee in King Arthur's Court*, 1889. But misfortune now entered his life. In 1884 he had invested money in the Charles L. Webster Co., a publishing house, which went bankrupt in 1894 and left him penniless. In 1895 he went on a world lecture tour, of which he wrote in *Following the Equator*, 1897, and earned enough to pay his debts. Private tragedy followed; his wife and 2 daughters d., leaving only his daughter Clara. The work of this period is uneven. *Pudd'nhead Wilson*, 1894, and *Personal Recollections of Joan of Arc*, 1896, rank with his best, but *Tom Sawyer Abroad*, 1894, and *Tom Sawyer, Detective*, 1895, are feeble sequels of the earlier book.

As his life drew to a close public honours were heaped upon him. Yale, which had given him an M.A. degree, made him LL.D. in 1901; the Univ. of Missouri followed suit in 1902 and Oxford in 1907. He built himself a house at Redding, Connecticut, where he d., as he had superstitiously expected, during the appearance of Halley's Comet, which had appeared at his birth 75 years before. His *Autobiography* was pub. in 1924, and material from the papers he left behind was ed. in sev. vols., including *Mark Twain's Travels with Mr. Brown*, 1940. During his later years he had become a sort of national legend, much as Bernard Shaw did in England. He was an artist in grotesque and somewhat obvious humour, his style and cadence suggesting a talker rather than a writer. He has

been called 'the Lincoln of Amer. literature.' His works were ed. in 37 vols. by A. B. Paine, 1922-5, who also wrote a 3-vol. biography, 1912. See also Van Wyck Brooks, *The Ordeal of Mark Twain*, 1920; C. Clemens, *My Father, Mark Twain*, 1931; S. Leacock, *Mark Twain*, 1933; B. De Voto, *Mark Twain's America*, 1932 and *Mark Twain at Work*, 1942.

Clemens Alexandrinus, Titus Flavius, see CLEMENT OF ALEXANDRIA.

Clement, name of 14 Popes:

Clement I, commonly known as C. of Rome (fl. AD 90). He is thought by some to be identical with C., the fellow-worker of Paul (see Phil. iv. 3). He succeeded Anacletus as Bishop of Rome. He was the author of the *First Epistle of Clement*, written to the church at Corinth about AD 95. This early document is of great value to the student of primitive Church hist. A fragment of it was found at the end of the *Codex Alexandrinus*, and was pub. in 1033 by Patrick Young (Patricius Junius). A complete MS. found at Constantinople was pub. in 1875. Sev. other documents have, with little or no authority, been attributed to this C. Consult J. B. Lightfoot, *The Apostolic Fathers*, vol. I, *S. Clement of Rome*, 1869, 1877; J. A. F. Grogg, *The Epistle of Saint Clement*, 1899.

Clement II (1046-7), formerly Sulzger, the chancellor of Emperor Henry III., who created him Pope.

Clement III (1187-91), Paolo Scolari, cardinal-bishop of Palestrina; urged the necessity of the third crusade upon Henry II of England and Philip Augustus.

Clement IV (1265-8), Guy Foulques le Gros, of a noble Provençal family, began life as a soldier, but later became cardinal-bishop of Sabina. He supported the claim of Charles of Anjou in Sicily, and was a friend to Roger Bacon.

Clement V (1305-14), Bertrand de Goth, was unduly influenced by Philip the Fair, at whose suggestion he suppressed the Order of Templars. He removed the papal seat to Avignon. Consult Rabines, *Clement V et Philippe le Bel*, 1858.

Clement VI (1342-52), Pierre Roger, a Frenchman, Archbishop of Rouen. He took the part of Queen Joanna of Naples against her brother-in-law, Louis of Hungary, who had invaded her dominions to avenge the murder of her husband.

Clement VII (1523-34), Giulio de' Medici. After the battle of Pavia (1525) he joined the It. cities in a Holy Alliance with France against the Emperor Charles V, but in 1527 Rome was sacked by the imperial troops, and he was kept prisoner in the castle of Sant' Angelo for 6 months. He refused to sanction Henry VIII's divorce from Catherine, which fact brought about the Reformation in England.

Clement VIII (1592-1605), Ippolito Aldobrandini, received the public profession of Catholicism made by Henry IV of France, whom he reconciled with his subjects. He annexed the Duchy of Ferrara to the papal states.

Clement IX (1667-9), Giulio Rospigliosi, brought about the peace of Aix-la-Chapelle in 1668 between France and

Spain; and for a while conciliated the Jansenists and Jesuits in France.

Clement X (1670-8), Emilio Altieri, was 80 years of age at the time of his election, and left the administration of affairs to his adopted nephew, Cardinal Paluzzo Paluzzi.

Clement XI (1700-21), Gian Francesco Albani, had trouble with the Jansenists in France, against whom he issued 2 bulls, *Vineam Domini Sabaoth*, 1705, and *Unigenitus*, 1713.

Clement XII (1730-40), Lorenzo Corsini, condemned the Freemasons (1738), and restored the rep. of San Marino to its liberties (1740).

Clement XIII (1758-69), Carlo Rezzonico, endeavoured with little success, to support the Jesuits, but before his death they were expelled from Franco, Spain, and Portugal.

Clement XIV (1769-74), Giovanni Vincenzo Antonio Ganganelli, succeeded C. XIII in troublous times. After vain negotiation he issued his famous brief, *Dominus ac Redemptor noster*, suppressing the Jesuits (1773). He was a liberal-minded statesman and a patron of art. He founded the Clementine Museum in the Vatican. *Consult* Ravignan, *Clement XIII et Clement XIV* (1854), and *Uschner, Clement XIV*, 1867.

Clément, Jacques (1564-89), Dominican friar, notorious as the murderer of Henry III of France. He was himself killed by Henry's attendants, and was regarded by his fanatical Catholic supporters as a martyr.

Clement of Alexandria (Titus Flavius Clemens Alexandrinus) (b. c. AD 150), distinguished Christian writer, b. probably at Athens, and spent most of his life in Alexandria, where he studied under Pantænus. During the persecutions of Severus he and his master fled to Palestine (c. 202-6), and in 211 he succeeded Pantænus as master of the school of Alexandria. His extant works are *Logos Protrepticos pros Hellenas* (*Hortatory Address to the Greeks*), *Paedagogos* (*The Tutor*, 3 books), *Stromateis* (*Miscellanies*, 8 books), and *Tis ho Szōmenos Plousios?* (*Who is the rich man that is saved?*). See C. Biggs, *Christian Platonists of Alexandria*, 1886; B. Tollington, *Clement of Alexandria, a Study in Christian Liberalism*, 1914; E. Leigh-Bennett, *Handbook of the Early Fathers*, 1920.

Clementi, Muzio (1752-1832), pianist and composer, b. Rome, where he studied as a child and at the age of 9 was appointed to a post as organist. He afterwards studied under Santarelli and Carpani, and by the age of 14 had composed sev. contrapuntal works. He attracted the attention of Peter Beckford, M.P., a cousin of the author of *Vathek*, who brought him to England, where C. continued to pursue his studies until the year 1773 when he made his début. He conducted the Royal It. Opera (1777-80); he then made a continental tour, and while at Vienna had a piano combat with Mozart, the victory being left undecided. On his return to England he founded a business as pianoforte-maker and musical

publisher in London. John Field was his assistant and pupil there, and in 1802 C. took Field on a continental tour. In 1813 he assisted in forming the Philharmonic Society. C. left about 70 sonatas, also symphonies and overtures, and was regarded as the father of modern pianoforte technique. His best-known work is the *Gradus ad Parnassum*, 1817—a collection of progressive studies, which have remained a valuable aid to piano technique. He is buried in the cloisters of Westminster Abbey.

Clement's Inn, formerly an inn of Chancery; took its name from the church of St Clement Danes, which stands in the Strand, London, opposite the street called C. I. A considerable part of the former site of the inn is now occupied by the Law Courts, while its functions as an inn of Court are now performed by the Inner Temple.

Clemmensen Reduction, in chem. a method of reduction (see REDUCING AGENT), applicable to a number of organic compounds, especially to aromatic ketones and secondary alcohols. It is named after the discoverer. The substance to be reduced is boiled in aqueous suspension or aqueous alcoholic solution with amalgamated zinc or zinc wool with sufficient hydrochloric acid to maintain its concentration above 6N. The presence of nitro or amino groups renders the reduction unsatisfactory. See also BENZOIN.

Cleobis, see BITON AND CLEOBIS.
Cleobulus of Lindus in Rhodes, one of the Seven Sages of Greece; he lived about 580 bc. He was distinguished for his strength and handsome person; and also for his riddles, in which his daughter Cleobule is said to have been no less proficient.

Cleombrotus I (380-371 bc), King of Sparta, brother and successor of Agestopolis. He waged war against the Thebans; in 371 bc he led the Spartans at Leuctra against the Thebans under Epaminondas, and was defeated and mortally wounded.

Cleombrotus II (c. 242-c. 240 bc), King of Sparta. On the expulsion of his father-in-law, Leonidas II, he was elected king by the party of Agis IV. On his return, about 3 years later, C. was deposed and banished to Tegea.

Cleomedes, Gk mathematician, who probably flourished in the 2nd cent. AD. He wrote, in 2 books, a treatise *On the Circular Theory of the Heavenly Bodies*. It sets forth the Stoic system of the universe, and gives various arguments in proof of the rotundity of the earth. Ed. by Bake (1820) and Ziegler (1891).

Cleomenes I (520-487 bc), King of Sparta, son of Anaxandrides. In 510 bc he took part in the expulsion of Hippas, the last of the Pisistratidae, from Athens. His assistance was called for by Isagoras and the aristocratical party in Athens against Cleisthenes, and he helped in the expulsion of 700 families. During the war with Argos he was successful in defeating the Argives near Tiryns.

Cleomenes II (370-309 bc), King of Sparta, succeeded his brother Agestopolis III.

Cleomenes III (c. 235–220 BC), King of Sparta, son of Leonidas II, last of the Agidae. He endeavoured to restore the ancient institutions of Lycurgus and strongly opposed Aratus and the Achaean League, by forming an alliance with Ptolemy, King of Egypt. He was at first successful in his campaigns against the Achaeans, but in 222 he was himself defeated at Sellasia in Laconica, and fled to Egypt, where he committed suicide.

Cleon (d. 422 BC), Athenian democrat, the son of Cleonetus. He was originally a tanner, and came forward into public life as an opponent of Pericles. During the Peloponnesian war, C. set himself up as the champion of the people and the leader of the peace party (428–422). In 427 he advocated in the assembly that the Mytilenaeans prisoners, sent to Athens by Paches, should be put to death, and in 424 he won great glory by his capture of the Spartans on the is. of Sphacteria. Much elated by his success, C. accepted the command of the Athenian army to oppose Brasidas in Macedonia and Thrace, but was defeated, and fell in battle under the walls of Amphipolis. C. is represented by Thucydides and Aristophanes as a demagogue of the lowest type, mean, ignorant, cowardly, self-seeking, and unscrupulous, pandering to the mob to obtain his own selfish ends. He is made to figure among the *dramatis personae* in Aristophanes' comedy, *The Knights*, but the poet was obliged to take the part himself as he could find no actor bold enough to personate C. It should, however, be remembered that both Thucydides and Aristophanes had a grudge against him, the former having been banished at his instance, and the latter's comedy, *The Babylonians*, was brought to the notice of the authorities by C. as an unpatriotic play and harmful to the country in time of war.

Cleonus, genus of Curculionidae, or weevils, consists of between 100 and 200 species of beetles. They have elongated and convex bodies, and both larvae and perfect insects are vegetarian, feeding chiefly on coniferous trees, such as the larch and pine.

Cleopatra, 'having a famous father,' name of many queens of the Ptolemaic dynasty of Egypt after C., daughter of the Seleucid Antiochus III, wife of Ptolemy V. The best known was the daughter of Ptolemy XI, b. c. 69 BC. At the age of 17 she became ruler of Egypt, jointly with a younger brother, Ptolemy XII. Two years later, deprived of authority by Ptolemy's guardians, Pothinus and Achillas, she withdrew to Syria and was on the frontier with a force when Caesar arrived at Alexandria in pursuit of Ptolemy. The personal fascination of C. induced Caesar to undertake a war on her behalf, in which Ptolemy lost his life, and she was replaced on the throne with a younger brother, Ptolemy XIII, of whom she soon rid herself by poison. In Rome she lived openly as Caesar's mistress, until his assassination in 44, when aware of her unpopularity she returned at once to Egypt, declaring

her son by Caesar, nicknamed Caesarion, joint ruler with her. In the civil war which followed Caesar's death she became the ally and mistress of Mark Antony. Their relationship was highly unpopular in Rome, and led to Antony's losing much support. Octavian, later Augustus, declared war on them, and defeated them in the sea battle of Actium (31) from which she fled with her fleet followed by Antony. Hearing a rumour of her death, Antony stabbed himself. C. made overtures to Augustus, but was unable to fascinate him, and in order to avoid being led in triumph through Rome as a captive at the wheel of his chariot, she killed herself by a cobra bite. To an imperious will, masculine boldness, and boundless ambition typical of most Macedonian queens, C. added great intellectual power and physical seductiveness, with which she twice nearly succeeded in becoming queen of the known world. See A. Stahr, *Cleopatra*, 1879, and Edwyn Bevan, *History of Egypt under the Ptolemaic Dynasty*, 1927.

Cleopatra's Needles, 2 granite obelisks erected by Thothmes III at Heliopolis in Egypt (c. 1475 BC) and re-erected by Augustus at Alexandria. During the removal to Alexandria the lower part broke away, and the Rom. engineers supported the angles on bronze slabs, one of which, with 3 reproductions, still supports the angles of the needle or obelisk which was placed on the Victoria Embankment in 1878. This needle weighs 186 tons and is 68½ ft high. The other was presented by the khedive to the U.S.A., and in 1881 was erected in Central Park, New York.

Clepsydra. Time-measuring (see HOROLOGY) by the rate of flow of water was brought into use almost at the same time as the sundial. Clepsydrae, or water clocks, were of many forms; they were used in many countries long before the sundial was perfected. They served to measure time during darkness as well as when the sun was not shining, thereby having an undoubted advantage over the sundial. The earliest Egyptian type comprised a vessel of flower-pot shape with a small hole near the base through which the water slowly escaped. The time was indicated by the level of the water in the vessel. With this type time measurement could not be accurate, since the rate of flow of the water must have varied as it got lower in the container, due to the force of gravity. In a much improved type, the water flowed from an upper vessel, which was always kept full to overflowing, into a lower one, and the passing of time was indicated by the rise of the water in the lower part. Later clepsydrae became complicated machines and developed on mechanical lines, employing toothed wheels, racks, and pinions. Plato (q.v.) is said to have introduced them into Greece; and Aristotle (*Athenian Constitution*) describes their use in the Athenian law-courts, c. 325 BC. Ctesibius (c. 250 BC), the son of an Alexandria baker, was admired for the invention of many ingenious clepsydrae.

In one of these the water dropped into a funnel from the eyes of a figure placed near a constantly full reservoir. Thence it was conveyed into an open cylinder in which there was a float carrying a light post. On top of this post was another figure, which pointed with a stick to a scale, engraved to indicate the hours.

Scipio Nasica introduced the C. into Rome c. 157 B.C. Later the Romans made sounding water clocks depicting the blowing of the wind, roaring lions, drums, etc. The elder Pliny states (*Historia Naturalis*) that Pompey (q.v.) brought back from the E. a valuable water clock which he used for limiting the duration of speeches by Rom. orators.

In the 1st cent. B.C. Andronicus of Cyrrhus built the Tower of the Winds at Athens. An octagonal structure of marble, it housed a C., was surmounted by a weather-vane, and carried sundials on each of its 8 sides.

The anc. Britons used clepsydrae working on the opposite principle. A bronze bowl with a small hole in its bottom was made to float in a pond or tank of water. The water leaking in through this hole gradually filled the bowl until it sank, to be retrieved, emptied, and replaced in the water, indicating the passage of an hour or some other period.

Water clocks are believed to have been generally unreliable and not so accurate as the sundials of the period, by which they were frequently checked.

Clerestorey (also **Clear-story**; Fr. *claire-voie*), term used in architecture to denote the windows in the upper part of the central nave of a church. Its purpose is to admit *clear* light, and this method of lighting was constantly used by the Romans in their baths and palaces.

Clergy (from Low Lat. *clericatus*, derived from Gk *klēros*, an inheritance), a collective term for clerks, or men in holy orders. In the N.T. Christians generally are described as the *kleros*, or the Lord's inheritance, or portion. But the term naturally came to apply most appropriately to those who were set apart from the ordinary faithful laity (Gk *laos*, people) and dedicated to the ministry. This distinction between C. and laity was marked by the development of clerical clothing, vestments, and insignia and by the introduction of the tonsure. At the Reformation this distinction was purposely diminished in Protestant communities. During the Dark Ages the Church, pursuing her civilising mission among the barbarians who had overrun the empire, preserved and maintained, at least among her clergy, the principles of Rom. law, modified by her own canons. Later, in the Middle Ages, when both kings and popes grew in power, the privilege of the C. to be subject to the milder Church law in eccles. courts with appeal to Rome, caused great envy and friction between Church and State, as did also the exemption of the clergy from direct civil taxation. It must be remembered that vast numbers of people were in minor

orders (see **ORDERS**), in addition to those we now recognise as C., and could claim clerical privilege. They included a high percentage of the total literate pop. The Anglican C. are still technically one of the 3 estates of the realm in England. Though bishops, however, sit in the House of Lords, they do so by reason of the baronies attached to their sees and not because they are Church dignitaries. C. suffer from disabilities now rather than privileges, being deprived of the normal citizen's right to become an M.P., or to teach in state schools. These disabilities do not affect Free Church ministers.

Clergy, Benefit of, see **BENEFIT OF CLERGY**.

Clergy Discipline Act, 1892, relates to the consequences of crimes or offences against morality by clergymen, and, in regard to the latter, provided a new form of procedure. The Act is divided into 2 parts, the first of which renders a beneficed clergyman liable to deprivation who is convicted in temporal court of an indictable offence, or against whom a bastardy order has been made, or adultery found in a divorce suit. The second part of the Act provides that a clergyman convicted by a temporal court of an act constituting an eccles. offence, or against whom any immoral act, conduct, or habit, being an offence against morality and not doctrine or ritual, is alleged, may be prosecuted by any of the parishioners of the par. in which he holds preferment, or by the bishop of the diocese, or a person approved by the bishop, and tried in the consistory court of the diocese. A conviction under the Act enables the bishop to treat preferment of the convicted clergyman as void, while conviction for an immoral act under the second part of the Act renders the clergyman liable, subject to an appeal to the queen in council, either to suspension or deprivation, with incapacity to hold another preferment. A clergyman may be re-instituted if pardoned by the Crown and if the benefice has not been filled.

Clergymen, Deposition of, see **DEPOSITION**.

Clericis Laicos, first words of a bull of Pope Boniface VIII (1294-1303). His arrogance made him many foes, his most noted conflict being that with Philip IV of France. In 1296, by the bull named *C. L.*, the Pope forbade the levying of taxes, however disguised, on the clergy without his consent. Boniface was forced to recede from his position, and canonised Louis IX. Hostilities were later renewed, and in 1302 Boniface drafted and pub. the bull '*Unam Sanctam*,' one of the strongest official statements of the papal prerogative ever made.

Clericus, Johannes, see **LE CLERO, JEAN**.

Clerihew (from E. *Clerihew* Bentley), short nonsensical or satirical poem, usually of 4 lines of varying length, e.g.:

Sir Christopher Wren
Said, 'I'm going to dine with some men.
If any one calls
Say I'm designing St Paul's.'

Clerk, John (1728-1812), author of

Essay on Naval Tactics, worked on his estate of Eldin at geology and etching, besides his new theories of naval manœuvres. His naval schemes were adopted with complete success in 1782 when Lord Rodney gained a complete victory at sea over the French. His essay was not pub. entire till 1804.

Clerk (from Lat. *clericus*, which comes from the Gk *kleros*, a lot, or inheritance) was at first a synonym of canon, and was used indifferently of all who were servants of the Church. Soon the term C. was used only of one in a minor as opposed to a major or holy order. But C. in holy orders is still the legal designation of ordained ministers of the Church. After the Reformation in England, the name C. was applied to members of the laity who assisted at baptisms, marriages, etc., and who led the responses for the congregation. In this sense the C. became known as the par. C. But the word has had another distinct, though parallel, development. Chaucer's poor 'clerk of Oxenford' was, above all, a devotee of learning. This sense of the term arose from the fact that in medieval times learning was practically confined to the clergy. Now this meaning is applied to all employees who write, make entries, and discharge the correspondence of any firm, company, or profession. In America a C. also means a retail salesman.

Clerk-Maxwell, see MAXWELL, J. CLERK.

Clerk of the Peace. This Eng. functionary is usually clerk to the co. council and is appointed by a joint committee of quarter sessions and the co. council. He receives a salary. He keeps the records of quarter sessions, and attends either personally or by deputy the justices in quarter sessions and advises them on the law relating to cases before them, and receives and takes custody of the quarterly returns of deaths from the local registrars of births, deaths, and marriages. A C. of the P. is generally by profession a solicitor, like a tn clerk of a bor. He cannot sit in parliament, as he is bound to devote all his time to his official duties. Formerly voters' lists were dealt with by the C. of the P. through the overseers, but these duties are now performed by the registration officer, who is usually the tn clerk. See also LOCAL AUTHORITIES, OFFICERS OF.

Clerke, Agnes Mary (1842-1907), astronomer and writer, b. Skibbereen, Co. Cork, lived in Italy and London, and made astronomical observations at the Cape when she stayed there with Sir David and Lady Gill. Although not a practical astronomer in the true sense of the word, she was endowed with remarkable talent for collecting and summarising results of scientific (including astronomical) research. Her pub. works include *A Popular History of Astronomy during the Nineteenth Century*, 1885, *The System of the Stars*, 1890, *Problems in Astrophysics*, 1903, and *Modern Cosmogonies*, 1905.

Clerkenwell, dist. in the N. of London in the bor. of Finsbury (q.v.), so called from a well in Foy St near which the par. clerks occasionally acted mystery plays. The site of the well is at 18 Farringdon St.

In St John's par. are the remains of the priory of the Knights of St John of Jerusalem. The order was suppressed at the Dissolution (1540), revived under Mary I. and suppressed again under Elizabeth I. A jail called the C. Bridewell was built here in 1615 to house the rogues and vagabonds of Middx; it was burned down in 1669 but rebuilt. It was succeeded in 1775 by the House of Detention, notorious as the scene of a Fenian outrage in 1867, and closed in 1877. C. became noted in the late 17th cent. as a spa (see SADLER'S WELLS). Watchmaking, an old industry in C., is still carried on, also the trades of jeweller and optician.

Clermont (-en-Beauvais), Fr. tn, cap. of an arron., in the dept of Oise, on a hill overlooking the Brèche. The tn hall is partly 14th cent., and there is a 15th-cent. church. Pop. 5300.

'**Clermont**,' The, was one of the earliest steamships. Its inventor and builder was an American, Robert Fulton (1765-1815), who in 1803 obtained jointly with Robert Livingston the exclusive privilege of navigating with steamers the waters of New York. The engines of the C. were provided by Boulton & Watt of Birmingham, and it traded on the Hudson between Albany and New York from 1807 onward.

Clermont-Ferrand, tn of France, cap. of the dept of Puy-de-Dôme, and anct cap. of Auvergne (q.v.). The 2 tns of which it is composed, Clermont and Montferrand, grew up on the slopes of a small eminence and were united in 1731. Clermont was built around a citadel, *Clarus Mons* or *Clarimontium*. It was the meeting-place of 7 ecclcs. councils between 535 and 1130. A bishopric since the 3rd cent., it has a splendid Gothic cathedral, begun in 1243, which contains fine medieval stained glass and frescoes. In the cathedral square is a monument to Pope Urban II (q.v.), who made here in 1095 the proclamation of the first crusade (see CRUSADES); on the same occasion Peter the Hermit (q.v.) preached in the 12th-cent. Romanesque church of Notre-Dame du Port. In Montferrand there is a medieval tn hall, and a church (13th-16th cents.) containing notable 17th-cent. wood carvings. In both parts of C.-F. there are remarkable Gothic and Renaissance houses. The univ. was founded in 1810. Rubber goods (including tyres), foodstuffs, textiles, and metal goods are manuf. St Gregory of Tours and Blaise Pascal (qq.v.) were b. at C. Pop. 108,000.

Clermont-Ganneau, Charles Simon (1846-1923), Fr. orientalist, b. Paris. C.-G. was educ. at the Ecole des Langues Orientales, and afterwards entered the diplomatic service as dragoman to the consulate at Jerusalem. Later he occupied a similar position at Alexandria. In 1870 he discovered the *stèle* of Mesha, a stone bearing the oldest Semitic inscription then known. He commanded a Brit. archaeological expedition to Palestine in 1874, and later a Fr. expedition to the Red Sea and Syria. Subsequently he became director of the Ecole des Langues Orientales. He became consul-general in 1896, and minister plenipotentiary in

1906. His chief pubs. include *Études d'archéologie orientale*, 1880, *Les Fraudes archéologiques*, 1885, *Recueil d'archéologie orientale*, 1885-1924, and *La Palestine inconnue*, 1886. He was principally instrumental in exposing the Shapira forgeries of Heb. texts offered to the Brit. Museum; other frauds he exposed were the Moabite potteries and the tiara of Saitarnarnes (see his *Les Fraudes archéologiques* above).

Clermont-L'Hérault, Fr. tn in the dept of Hérault. It has a textile industry. Pop. 5200.

Clerodendron, genus of Verbenaceae, flourishes in its wild state in tropical and warm climates, but in Britain grows only in greenhouses. *C. thomsonae* is a commonly cultivated evergreen plant which bears red and white flowers. *C. fragrans* and *C. trichotomum* are both shrubs, the former with white, the latter with variegated flowers.

Cléry, Sir Cornelius Francis (1838-1926), soldier. He saw active service in the Zulu war of 1879; was present at the battles of Isandhlwana and Ulundi. Fought in the battles of El Tob and Tanai, and was mentioned in dispatches. He served in the Gordon relief expedition, 1885, and during the years 1886-8 was chief of staff of the army of occupation in Egypt. He commanded the 2nd Div. in the S. African war of 1899-1902. K.C.M.G., 1900.

Cléry-Saint-André, Fr. tn in the dept of Loiret, near Orleans. Near it is a tumulus, called by the peasants the tomb of Attila. Pop. 1800.

Clésinger, Jean Baptiste Auguste (1814-1883), Fr. sculptor, b. Besançon, intimately connected with the story of George Sand and Chopin. George Sand's daughter Solange, who inherited her mother's passionate nature without any of her genius, eloped with C. after sitting to him for her bust. The mother arranged a private marriage, estab. the young people in Paris, and settled a large share of her property upon them. But C. proved himself an ungrateful rogue, and George Sand was obliged to disown him and her daughter. C. was nevertheless one of the leading sculptors of his day, and executed noteworthy portraits of George Sand and Chopin. Among his works, many of which were objected to on the ground of their immodesty, are allegorical representations of Tragedy and Literature and a marble statue of Louise de Savoy.

Clethra, genus of lime-hating shrubs or small trees, about 30 species, family Clethraceae; *C. alnifolia* is the Sweet Pepper Bush, and with other species is grown in gardens for their fragrant late summer flowers.

Clevedon, par. and attractive watering-place, 1 m. from the Severn and 16 m. SW. of Bristol, in the N. of Somerset, England. Interesting for its associations, for here lived Coleridge and his bride at Myrtle Cottage (1795), and in the par. church lie Henry Hallam, the historian (d. 1859), and his poet son, Arthur (d. 1833), to whose memory Tennyson's *In*

Memoriam was written, whilst the original of Thackeray's Castlewood in *Esmond* is C. Court. Pop. 9765.

Cleveland, Barbara Villiers, Duchess of (1641-1704), mistress of Charles II of England, daughter of Wm Villiers, 2nd Viscount Grandison, b. Westminster. In 1659 she married Roger Palmer, who was made Earl of Castlemaine 2 years later. She became intimate with Charles II about May 1660, and had great influence with the king for about 10 years, being created Duchess of C. in 1670. Her sons by the king became dukes of C., Grafton, and Northumberland.

Cleveland, or Cleiveland, John (1613-1658), poet, b. Loughborough, Leics., son of a curate. At Christ's College, Cambridge, he was a contemporary of Milton, and in 1634 he became a fellow of St John's, but was ejected in 1645 because of his Royalist sympathies. He became judge-advocate of Newark for a time, but in 1655 was imprisoned at Yarmouth as a Royalist. C. belongs to the group of Cavalier poets that included Lovelace and Suckling, with this great difference that his genius was for satire. It was his trenchant invective, coupled with his wealth of allusive conceits and his rare command of rhythm, that gave him a contemporary popularity far eclipsing Milton's; at his best he can be compared with his friend Samuel Butler, of *Hudibras* fame. His first vol. of poems appeared in 1647. His most famous satire is 'The Rebel Scot,' denouncing the Scots' betrayal of Charles I; others are 'The Mixed Assembly,' 'Smectymnus,' and 'Rupertismus.' His work as a 'character' writer in the manner of Theophrastus is best seen in *The Character of a London Diurnall*, 1647.

Cleveland, Stephen Grover (1837-1908), 22nd and 24th President of the U.S.A., b. Caldwell, New Jersey. He was descended from Moses C. of England, who settled near Woburn, Massachusetts, in 1635. His father was the son of a watchmaker and was pastor of the Presbyterian church at Caldwell. When he was 16 his father d., and the son left school to become self-supporting. He then studied law, being admitted to the Bar at Buffalo in 1859. He entered politics as a Democrat, and his rise was rapid. In 1863 he became assistant dist. attorney for Erie co., in which Buffalo is situated. He was elected sheriff in 1870, and in 1881 he became mayor, being noted for his reforms. This attracted the attention of the state leaders, who brought about his nomination for governor, and he was elected to that office in 1882. He was nominated for the presidency in 1884, and was elected after an exceedingly bitter campaign. C. resisted the old system of 'to the victor belong the spoils,' by steadily advocating that an increasing number of governmental employees and officials should be placed in the civil service and, therefore, not be removable except for cause. In 1887 in a message to Congress he pleaded for the admission to the country of raw materials needed in manufacturing free from duty. This

was his famous battle cry of 'Tariff for revenue only.' He was renominated by the Democrats for the presidency in 1888, and, much to the country's surprise, was defeated by Benjamin Harrison, the Republican candidate. In 1892 the Democrats nominated C. for the presidency again, and he was triumphantly elected. Difficulties soon arose. In the first place he fought Republican tariff schemes. Then, against the wishes of many of his own party, he forced Congress to repeal the Sherman Silver Purchasing Act, thereby safeguarding the gold standard. In 1895 his strong advocacy of the Monroe doctrine in a dispute between Great Britain and Venezuela over the boundaries between the latter country and Brit. Guiana almost involved the U.S.A. in a war with England. Feeling was tense in both nations, but the situation was saved by the statesmanship of Lord Salisbury, who was then Brit. Prime Minister. Before he left the White House C. saw his gold-standard policy repudiated by his party, which had nominated to succeed him W. J. Bryan (q.v.), who ran on a free silver platform. C. retired and settled quietly at Princeton, New Jersey. See biographies by Robert McElroy, 1923, and Allan Nevins, 1932.

Cleveland (cliff-land), parl. div. in the E. of the N. Riding of Yorks, extending from Whitby to the R. Tees. It received its name from the cliffs which form the NE. borders of the Yorks moors. It is a dist. of wild highlands, interspersed with a few cultivated and pleasant valleys. Since the discovery of the rich beds of iron ore in its hills (see CLEVELAND IRONSTONE) C. has grown into a great industrial centre, with Middlesbrough as its chief tn, supplying Great Britain with one-third of its pig-iron. The pop. is not returned separately.

Cleveland, one of the largest industrial cities of the U.S.A., in Ohio, cap. of Cuyahoga co., and a railway centre, on the S. shore of Lake Erie. The 2 divs. of C., on either side of the R. Cuyahoga, are united by viaducts. The first, built in 1878, is of stone, and spans the riv. at a height of 60 ft, whilst the second, of iron, which was erected in 1888, is 3931 ft long, and rises 100 ft above the valley's base. Numerous bridges cross the riv. harbour, whilst beyond the mouth a breakwater, 2 m. long, encloses an excellent outer roadstead. During 1890-1900 the tonnage of ships constructed in C. exceeded that of the vessels built in any other Amer. tn. A great deal of traffic passes over the lake. The wealth of the city depends on its manufs., and above all on its flourishing iron industry. Thus engines, steel and iron vessels, automobiles, boilers, steel rails, and bridges are constructed at the various works, besides nails, agric. implements, and screws. The reason of this is that the city is centrally situated for obtaining coal from N. Ohio, iron ores from Lake Superior, and limestone from the is. of Lake Erie. The Detroit-Superior high-level bridge affords a wide view of lake and riv., harbour and breakwater, iron and steel, lumber and coal,

ore vessels, blast furnaces and foundries, flour mills and grain elevators, and on the banks above the valley vast manufacturing plants. Rising from a plain from 50 to 140 ft above the lake, C., the Forest City, presents an imposing appearance, with the fine public buildings of its Mall, including the C. Public Library (2,700,000 vols.), the Auditorium (seating 12,000), and the stadium, its large squares and stately mansions, its famous Euclid Avenue with winding walks and flower-bordered driveways, its W. Reserve Univ., Case Institute of Technology, and technical high school, and its municipal airport, one of the largest in the world. Other points of interest: C. Museum of Art, Severance Hall (home of the C. Symphony Orchestra), and the Play House (civic theatre). Founded in 1796 by Moses Cleveland, it is now the seventh city in the U.S.A. Pop. 914,800.

Cleveland Bay Breed, see HORSE.

Cleveland Heights, city in Ohio, U.S.A., residential suburb E. of Cleveland. Pop. 59,100.

Cleveland Ironstone is mined in the Middle Lias of C., which is situated in the N. Riding of Yorks, between the Tees and Whitby. Certain geologists believe that this dark green clay ironstone, which is not so valuable as that of the coal measures, was 'derived partly from mechanical deposition and partly from subsequent chemical replacement of the originally deposited carbonate of lime.' The theory that once the bed was limestone is supported by the discovery of shells such as *Pecten* and *Arvicula*. Only 60 per cent of the ore is carbonate of iron, the rest being composed of phosphates, silica, and argillaceous matter. It is found in seams 20 ft thick, and is worked on the bord-and-pillar system, Middlesbrough being the centre. Its discovery, which dates from 1851, has revolutionised sleepy hamlets into industrial tns.

Cleves, Anne of, see ANNE OF CLEVES.

Cleves (Ger. Cleve, or Kleve): 1. Former duchy of Rhenish Prussia, united with Brandenburg (q.v.) in 1666.

2. Ger. tn in the *Land* of N. Rhine-Westphalia (q.v.), lying between the Rhine (q.v.) and the Dutch border, 47 m. NW. by N. of Düsseldorf. It was very severely damaged during the Second World War. The Schwanenburg castle, partly built on a high rock, is associated with the legend of Lohengrin (q.v.). Ann of C. (q.v.) was b. here. There are textile manufs. Pop. 31,000.

Clew Bay, inlet on the W. coast of co. Mayo, Rep. of Ireland. From the Atlantic it passes inland for 15 m., with an almost uniform breadth of 8½ m. Clew Is. faces its entrance, whilst the upper portion is dotted with an archipelago of some 300 fertile islets.

Clewer, name of 2 pars., C. Without and C. Within, part of the royal bor. of New Windsor, Berks, England, on the R. Thames. The par. church of St Andrew at C. Without dates from 1040. Pop. of C. Without is about 18,000; of both pars. 22,000.

Clews, 2 bottom corners of a square

sail. In a fore-and-aft sail the aftmost corner is termed a clew, the other, or weather clew, being more generally called the tack.

Clianthus, genus of Leguminosae cultivated in greenhouses on account of their showy flowers. *C. formosa* is the Glory Pea. *C. puniceus*, the parrot's beak, can be grown outdoors in the mildest parts of Britain.

Cliché, literally a stereotype plate, signifies a hackneyed phrase or expression which, though vivid and arresting when it was first coined, has lost its force through constant use. Typical C.s are 'to explore every avenue,' 'last but not least,' 'a foregone conclusion,' 'the long arm of coincidence.' Excessive use of such terms is a fault, though the over-scrupulous avoidance of them may produce an affected style. See E. Partridge, *A Dictionary of Clichés*, 1947.

Clichy, or **Clichy-la-Garenne** (anc. Clippiaum), Fr. tn in the dept. of Seine, a NW. suburb of Paris. St. Vincent de Paul (q.v.) was curé here. It has chemical, gas, rubber, and foodstuff manufs., and oil refineries. Pop. 53,000.

Click-beetles, or *Elateridae*, form a family of coleopterous insects, most of which have the useful characteristic of being able to right themselves when fallen on their backs; this they accomplish by springing into the air by means of special processes in the back, and the movement is accompanied by a loud clicking sound. They are also called skip-jacks when possessed of this habit. The larvae are often known as wire-worms, and are very destructive; their home is usually underground, and their food the roots of crops.

Client, supposed by some writers to be derived from Lat. *cliere*, to hear. From the very beginnings of anc. Rome there appears to have existed the relation of patronage (*patronatus*) and clientship (*clientela*). When a man manumitted (analogous to emancipated) a slave, he became the *patronus* instead of the *dominus* of the slave, who was thenceforth a freed man (*libertus*). The tutelage of the *patronus* entitled him to a specific share in the freedman's estate after death. This relationship at Rome fostered the formation of similar relationships between foreigners and Rom. citizens, the result being that the foreigner obtained a protector and the Romans an accession of influence from occasionally becoming the patrons of a man of letters. The poet Terence, for example, was a *libertus*, being manumitted by P. Terentius Lucarius, a Rom. senator. The Rom. C. was defended in lawsuits by his patron; hence the adoption of the term in modern legal practice.

Clifden, mkt tn and port, cap. of Connemara, co. Galway, Rep. of Ireland, 40 m. SW. of Westport. There is magnificent mountain scenery inland (The Twelve Pins), and Kylemore Castle, now a convent school, is 12 m. to the N. Alcock and Brown landed near here (1919) on their first non-stop flight across the Atlantic from St John's, Newfoundland. Pop. 800.

Cliff Dwellings, certain remarkable ruins of houses, built in horizontal recesses down precipitous cliffs in W. Colorado, Arizona, Utah, and New Mexico. The traveller, as he sees the remains of what must once have been a well-constructed dwelling of lime and stone, with windows and doors both rectangular in frame, is struck above all by its extreme solitude and inaccessibility. Its former inhab. must surely have been in hiding from his foes, for his home was built in a hollow, with beetling crags overhead, so that it was quite invisible from the cliff summit. In one such ruin the footholes carved in the rock-face may still be seen, but it seems certain that the ascent from the valley below was usually made by ladders or ropes, which could be carried up after use. For the most part these perilous homes are found dotted here and there along the great canyons or gorges, but in the Rio de Chelly there is a cluster of them large enough to be called a tn. There is one in Colorado above the R. Mancos, which looks down from a giddy height of 800 ft, but the most renowned in that country is the great cliff dwelling known as the palace of Chaplin's Mesa. These dwellings, which rose sometimes to 2 or even 3 storeys, so strongly resemble the pueblos of the Indians near by that most archaeologists are agreed in referring their construction to the immediate forerunners of the Pueblo tribes. Another type of dwelling found in this region is in caves formed by volcanic action in the side of canyons. The honeycomb of openings formed similarly on the face of the cliffs provided windows for the Indian inhab.

Clifford, Anglo-Norman family descended from Richard Fitzponce. His son Walter, who adopted the name C. on acquiring by marriage C. Castle on the Wye, near Hereford, was the father of Fair Rosamond, Henry II's mistress. According to popular legend she was kept by the king in a secret tower at Woodstock, in the heart of a labyrinth which only he could thread. On her death in 1176 she was buried in Godstow nunnery, there being little foundation for the legend that she was murdered by order of Queen Eleanor.

Clifford, Sir Hugh Charles (1866-1941), colonial governor; b. London and educ. at Woburn Park and Sandhurst. In 1883 he became a cadet in the Malay States civil service. In Pahang he became Brit. resident (1896-9 and 1901). In later years he was associated first with Trinidad and Tobago (1903-7) and then with Ceylon (1907 and 1909), always as colonial secretary. Governor of the Gold Coast, 1912-19; of Nigeria, 1919-25. As Governor of the Gold Coast C. was responsible for the Brit. sphere of occupation in Togoland, 1914-19. Governor of Ceylon, 1924-7; then Governor of Straits Settlements until 1929. G.C.M.G., 1921; G.B.E., 1925. He married Mrs Henry de la Pasture, the novelist and playwright, who d. 1945. C. was joint editor of a Malay language dictionary. Other pubs. include *Further India*, 1904, *Malayan Monochromes*, 1913, *The German*

Colonies, 1918, *The Gold Coast Regiment in the East African Campaign*, 1920, and *Bush-Whacking and other Asiatic Tales and Memories*, 1929.

Clifford, John, (1836-1923), Baptist minister, was b. in poverty at Sawley, Derbyshire; eldest child of Samuel C., Chartist and Calvinist. As a child he worked in a lace factory. Some Baptists became interested in him, and started him in education at the Baptist College, Nottingham. He received a call to Praed St Chapel, Paddington, in 1858, and while in that ministry he attended Univ. College. He took B.A. degree, Lond., in 1861; B.Sc. in 1862, with honours in logic, moral philosophy, geology, and palaeontology. In 1864 he became M.A. (coming out first); in 1866, LL.B. The Geological Society made him a fellow in 1879. In 1883 he was made honorary D.D. of Bates College, Maine, U.S.A.; thereafter he was known as Doctor C. His ministry had been transferred to Westbourne Park when the chapel there opened in 1877: he was its minister till 1915, when he released himself for more general activity. In 1897 he made a tour round the world. He was president of the London Baptist Association, 1879; the Baptist Union, 1888 and 1899; the National Council of Evangelical Free Churches, 1898-9; the Brit. Chautauqua, 1899-1900; Baptist World Alliance, 1905 and 1911; and Baptist European Congress, 1913. He was an ardent and pugnacious Liberal, and was a leader of the Passive Resistance Movement against the payment of rates for denominational schools. Many of his printed works (about 100 titles) concern social problems. They include *Is Life Worth Living?*, 1880, *Inspiration and Authority of the Bible*, 1892, *The Secret of Jesus*, 1904, *The Ultimate Problems of Christianity*, 1906, *State Education after the War*, 1916, *The League of Free Nations*, 1919, and *The World Brotherhood according to Jesus*, 1920. He ed. the *General Baptist Magazine*, 1870-83. He d. suddenly at a meeting of the Baptist Union Council, 20 Nov. 1923.

Clifford, Lucy, née Lane (d. 1929), Brit. novelist and playwright, b. Barbados. In 1857 she married Wm Kingdon C. (q.v.). Her first pub. was *Anyhow Stories*, 1882, a book for children. *Mrs Keith's Crime*, 1885, was her first novel, and *Aunt Anne*, 1893, was her most popular. Others are *Sir George's Objection*, 1910, *The House in Marylebone*, 1917, and *Miss Fingall*, 1919. Her plays include *A Supreme Moment*, 1900, *The Searchlight*, 1903, *The Latch*, 1908, *A Woman Alone*, 1914, and *Eve's Lover*, 1927.

Clifford, Rosamond, see CLIFFORD (family).

Clifford, Thomas, 1st Baron Clifford of Chudleigh (1630-73), statesman, b. Devon and educ. at Exeter College, Oxford. He was one of the members of the 'Cabal,' being instrumental in arranging the treaty of Dover, 1670. A Rom. Catholic, he supported the Declaration of Indulgence issued by Charles II, and on the bringing in of the Test Act resigned from

public life. See life by C. H. Hartmann, 1937.

Clifford, William Kingdon (1845-79), mathematician and philosopher, b. Exeter. He was educ. at King's College, London, and Trinity College, Cambridge (fellow, 1868); prof. of mathematics at Univ. College, London, 1871, and F.R.S., 1874. He delivered many lectures before the Brit. Association and at the Royal Institution which were very popular. Amongst his works are *Elements of Dynamics*, 1879-87, *Seeing and Thinking*, 1879, *Lectures and Essays, Mathematical Papers*, 1882, *The Common Sense of the Exact Sciences*, completed by Prof. Karl Pearson, 1885, and papers on looi, biquaternions, and Riemannian space.

Clifford's Inn, once the tn house of the barons Clifford, was left to students of law. It became an inn of Chancery and, like Clement's Inn (q.v.), was subsequently absorbed by the Inner Temple. The buildings are now used as offices and flats.

Clifton, suburb and residential dist. of Bristol in Glos., England. The fine gorge of the Avon, spanned by Brunel's famous suspension bridge, cuts through the plateau on which the tn is built. The bridge, which took from 1832 to 1864 to build, has a span of 702 ft, and is 245 ft above high-tide level. C. is the seat of a Rom. Catholic bishop. Pop. included in Bristol. (See photograph on p. 532.)

Clifton Brown, Douglas, see RUFFSIDE, 1st Viscount.

Clifton College, public school for boys, founded in 1862, and incorporated by royal charter in 1877.

Climacteric Years (Gk *klimaktēr*, rung of a ladder) were supposed to be certain years in a man's life which specially affected him as regards health and general circumstances of life. These years were those made up by the odd multiples of 7, as 49, and the grand C. was reached at 63, when 9 and 7, the 2 mystical figures, were multiplied. As applied to a woman, it refers to the period known as the change of life, occurring usually between the ages of 45 and 50.

Climatology (from Gk *klinein*, to slope), that part of meteorology (q.v.) which deals with the average weather of a region, the period of averaging being months, years, or cents. The word is derived from the fact that one of the most important factors in climate is the average inclination of the sun's rays, which in turn depends on lat. or distance N. and S. of the equator. Of equal importance are the position of the region relative to the oceans and its geographical features, such as mts. The 3 prin. divs. of the subject are C. at breathing level, upper-air C., and microclimatology.

For C. at breathing level the observations are taken at a height of about 4 ft above the surface, and the data studied cover all the elements of weather that affect human activities and health. Special attention is now given to the needs of agriculture, industry, transport, etc. The records include mean daily, monthly, and ann. temps., and monthly and ann.

rainful totals, as well as maximum and minimum values. Other data collected relate to pressure, humidity, sunshine, cloud amount, and the frequency of days of frost, snow, hail, thunderstorms, and gales. The main facts are summarised in *Tables of Normals and Climatological Atlases* pub. by nearly all the national meteorological services of the world. These facts indicate that it is possible to consider a div. of the world into a number of *climatic zones* with comparable climatic features. The main zones are: (a) the

conditions, such as severe icing. Micro-climatology refers to the detailed study of the atmosphere very near the surface and is of importance in public health, agriculture, water conservation, and the prevention of atmospheric pollution.

The climate of any large region changes very slowly, but it is possible to recognise that important variations have taken place during the hist. of the earth. Some hundreds of thousands of years ago the climate of N. Europe was glacial (the Ice Age), but this was followed by a warm



Valentine & Sons Ltd, Dundee

CLIFTON SUSPENSION BRIDGE AND THE RIVER AVON

equatorial zone, covering the hot wet forests and the Doldrums (q.v.); (b) the subtropical zones, which include most of the great deserts and the steppes and, over the oceans, the trade-wind belts (q.v.) and the horse lats. (q.v.); (c) the zones of temperate rainy climates (such as that of NW. Europe); and (d) the polar regions. Within these zones, however, great variations may occur, especially in relation to continental and maritime climates. Great Britain has a typical maritime climate, with an equable temp. throughout the year and rain in all seasons. The U.S.A., because of its great area, has both maritime and continental climates.

Upper-air C. is a comparatively new study, necessitated by the development of air transport on a global basis. The data collected, which are essential for the economic running of civil air lines, refer chiefly to winds and temps. at all heights, including the stratosphere (q.v.), and the frequency of occurrence of dangerous

period from about 5000 to 3000 B.C. Other evidence indicates that during the great voyages of exploration of the Vikings, Greenland was more habitable than at present, and there is evidence of enhanced rainfall and storminess in Europe in the 12th and 14th cents. A.D. The exact cause of these major fluctuations is not yet decided, and there is no known method whereby future changes, if they will occur, can be forecast. Some authorities claim to have traced a connection between climatic changes and the rise and fall of cultures in the early days of civilisation, but their views are not universally accepted.

For further information see GEOGRAPHY; METEOROLOGY; TOPOGRAPHY. See also: H. W. Dickson, *Climate and Weather*, 1928; A. A. Miller, *Climatology*, 1931; C. E. P. Brooks, *Climate*, 1932, and *The British Climate*, 1954; W. C. Kendrew, *The Climate of the Continents*, 1937; S. F. Markham, *Climate and the Energy of*

Nations, 1942; O. G. Sutton, *Micro-meteorology*, 1953.

Climax (Gk *klimax*, ladder) is a figure of speech in which words, phrases, or clauses are arranged so as to increase in force or impressiveness till the last, as in this passage from Cicero: 'It is an outrage to bind a Roman citizen; to scourge him is an atrocious crime; to put him to death is almost a parricide; but to crucify him, what shall I call it?' See also **FIGURE OF SPEECH**.

Climbers, popular form of the old term *Scansores*, which was applied to birds of a climbing habit, many of which were characterised by having 2 toes turned backwards and 2 forwards. Examples of this obsolete order are woodpeckers, parrots, cuckoos, and cockatoos.

Climbing, Mountain, see **MOUNTAIN-CLIMBING** and **ROCK-CLIMBING**.

Climbing Plants. At least 6 distinct and different ways of climbing are used by plants: (1) by twining their stems round a support, like honeysuckle, hop, etc.; usually anti-clockwise, though the hop twists clockwise; (2) by tendrils, like passion flower, sweet pea, etc.; (3) by aerial roots, like ivy, Virginia creeper, etc.; (4) by hooked prickles, like roses, brambles, etc.; (5) by petioles or leaf stalks, like clematis, nasturtium (*Tropaeolum*), etc.; (6) by leaf stipules, modified as tendrils, like *Smilax*. They also climb by just scrambling through growth, like *Polygonum*. C. P. are cultivated for their beauty and utility, to dress bare walls, trellis, pergolas, arbours, tree stumps, etc. Hardy perennial C. P. include *Aristolochia*, *Campsis*, *Celastrus*, *Clematis*, *Hedera*, *Hydrangea petiolaris*, *Lonicera*, *Polygonum*, *Parthenocissus*, *Vitis*, and *Wisteria*. Half-hardy C. P. like sweet pea, *Tropaeolum*, etc., are raised from seed each year, others may be grown under glass. There are deciduous and evergreen C. P.

Clincher, see **CLINKER**.

Clinical Thermometer, see **THERMOMETER** and **THERMOMETRY**.

Clinker, or **Clincher**: 1. Term used in small boat construction, to indicate that the planking of the hull is laid with overlapping edges and not edge to edge as in carvel.

2. Incombustible residue left in coal- and coke-fired furnaces. It tends to collect in masses in the furnace and would adhere to the fire-bars if not removed from time to time. When cold it hardens and is usually employed in concrete-mixing and in road-making.

Clinograph, draughtsman's instrument for drawing a number of similar triangles in succession. It resembles the carpenter's bevel in principle, but its stock and blade are of the same thickness. It is very useful in graphic calculations in statics.

Clinometer, instrument for measuring the angle of inclination of surfaces. A simple form consists of a stout folding footrule with a level on each limb. It is held firmly against a vertical rod and opened until the line of sight along the inclined limb is in the required direction,

the other limb being kept horizontal. The angle is shown on a graduated brass dial at the hinge. The India C., used in plane-tables, is an 8-in.-long base with level and levelling screw and a folding vane at each end. One vane has a longitudinal slit and is graduated in natural tangents and degrees, the other has an eye-hole on the level of the zero of the scale. The Abney C. is a 4-in.-long square or circular tube with a pinhole eyepiece. A level is pivoted on a transverse horizontal axis fixed above the tube and may be turned by a milled wheel. A hole in the upper wall of the tube allows the bubble of the level to be seen reflected on a small mirror at 45° to the tube axis, the mirror filling half the cross-section. The direction is sighted through the tube and the wheel is turned until the reflected image of the bubble is seen. The rotation of the wheel is read on a circular scale, the level carrying an index.

Clinton, Amer. family founded by Charles C. (1690-1773), b. Ireland. He left Ireland for America and estab. himself in Ulster co., New York.

James Clinton (1736-1812) was the son of Charles C., and served in the U.S. Army. He was the father of De Witt C. **George Clinton** (1739-1812), son of Charles C.; in 1775 joined the army, after having sat in the New York Assembly. He held a high place in the army, and in 1777 was appointed Governor of New York, becoming finally vice-president of the U.S.A., an office which he held till his death.

Clinton, De Witt (1769-1828), Amer. statesman, began his political career by acting as private secretary to his uncle, George, the leader of the Republican party at New York (1790-5). From 1798 to 1801 he was a member of the State Legislature, and was a U.S. senator, 1802-3. Three times (1803-7, 1808-10, and 1811-15) he was mayor of New York city. He was Governor of New York state, 1817-21 and 1825-8. In Congress he identified himself with the movements for abolition of slavery and of imprisonment for debt, and for improvement of the free public schools system. In 1825 he was present at the opening of the canal between the Hudson R. and Lake Erie—an undertaking which had been carried through largely as the result of his persistent efforts.

Clinton, Sir Henry (c. 1738-95), son of Adm. George C. He began service in the militia in New York, but became lieutenant in the Grenadier Guards in England in 1751, and captain and Lieutenant-colonel in 1758. Major-general. 1772. He took part in the Seven Years War and the Amer. War of Independence. In 1778 became commander-in-chief in N. America, quarrelled with his second in command and resigned, 1781. General. 1793. In 1772-84 and 1790 he sat in Parliament, and in 1794 was appointed Governor of Gibraltar.

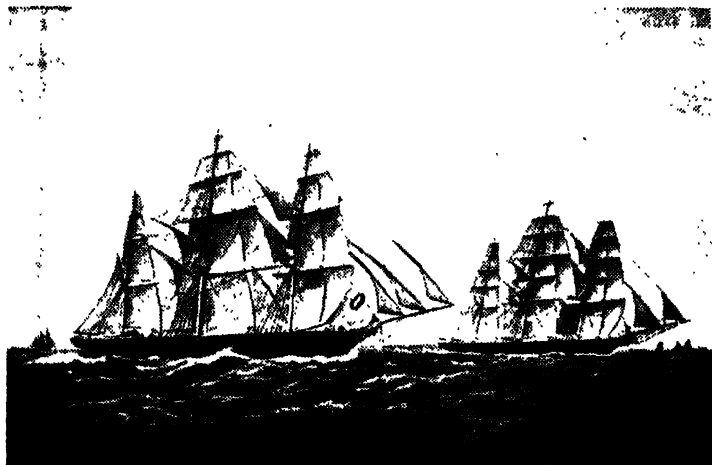
Clinton, Sir Henry (1771-1829), younger son of Gen. Sir Henry C. He served in the Corunna campaign; commanded the

6th Div. under Wellington in the Peninsula; Lieutenant-general, 1814; served at Waterloo; M.P., 1808-18.

Clinton, Henry Fynes (1781-1852), scholar, b. Gamston, Notts. Educ. at Westminster and Oxford, he produced important works on Gk and Rom. chronology, *Fasti Hellenici*, 1824-30, and *Fasti Romani*, 1845-50. Epitomes of both were pub. later.

Clinton, city, co. seat of C. co., Iowa, U.S.A., on the Mississippi R. (with bridges) 138 m. W. of Chicago. It is an industrial and railway centre. Pop. 30,400.

Clipperton Island, isolated coral atoll at 10-18° N. lat., 109-15° W. long., officially part of Fr. Oceania (q.v.), called after John Clipperton, mate on a ship of the Eng. navigator Wm Dampier. In 1704 he mutinied and, with 21 others, made the atoll his hide-out. Listed as one of the U.S. guano is. In 1856, it was later annexed by France. In 1897 it was seized by Mexico, who kept a garrison there for some years. A Brit. firm worked phosphate deposits on the is. between 1906 and 1917, about 100 people regularly receiving supplies from Mexico. At the



Hulton Picture Library

THE CLIPPERS 'ARIEL' AND 'TEAPING,' 1866

A contemporary print of the meeting of the two vessels off the Downs after a voyage of ninety-nine days from Foochow.

Clinton Group, name assigned by geologists in New York to the Upper Silurian series of rocks, composed chiefly of argillaceous sandstone.

Clio, muse of hist., represented crowned with laurels, with a book in one hand, and in the other a trumpet.

Clio, genus of naked marine gastropod or wing-footed molluscs (pteropods) so called because they are constructed for moving through water by means of fin-like membranes which are lateral expansions of the foot. *C. borealis* is a species which abounds in N. seas and constitutes a great portion of the food of the Greenland whale.

Clipper, sailing ship constructed for very rapid sailing. It is longer and narrower than an ordinary sailing vessel. Many of these C.s, which were used frequently in the transport of tea from the E., were built at Aberdeen, but they are not used now. The term has been borrowed for the craft of a U.S. airline which provides service on long sea routes.

outbreak of war in 1914 they were forgotten by the Mexican authorities, and in the following 3 years most of them d. of starvation or sickness. To-day the is. is uninhabited.

Clippiacum, see CLICHY.

Clissold Park, public park in the bor. of Stoke Newington, N. London. It was acquired in 1887, and opened in 1889.

Clisson, tn in the dept Loire-Inférieure, France, 17 m. SE. of Nantes. The tn and castle, belonging to the celebrated C. family, were destroyed in 1792-3 during the Vendean wars; the former was rebuilt in the 19th cent. Pop. 3200.

Clitheroe, mkt tn and municipal bor. on the Ribble, at the foot of Pendle Hill, in the C. parl. div. of Lancs, England, 35 m. N. by W. from Manchester. C. has cotton mills, foundries, printing estabs., and important lime and cement works in the neighbourhood. Its free grammar school was estab. in 1554, and there are still some remains of an 11th-cent. castle, which with the grounds were

purchased for the tn as a memorial of the First World War. Pop. 12,000.

Clitus, or **Clitus**, surnamed 'Melas,' 'the Black,' was the brother of Alexander's nurse, Helleniké. C. was made one of Alexander's lieutenants, and saved his life at the battle of Granicus in 334 bc. He was made satrap of Bactriana in place of Artabazus in 328. At a banquet, when Alexander was present, he dared to criticise the luxury of the latter's court, and to extol the virtues of Philip. Alexander, who was drunk, killed C. on the spot, and was afterwards overcome by remorse.

Clive, Caroline (1801-73), authoress, b. London, daughter of Edmund Meysey-Wigley. In 1840 she married the Rev. Archer C. She pub. sev. sets of poems, signed 'V.,' but her best book is a novel, *Paul Ferroll*. 1841.

Clive, Catherine (Kitty) (1711-85), actress, daughter of Wm Rastor, a man of good family. About 1727 she came under the notice of Colley Cibber, manager of Drury Lane, and a place was found for her in the company, where she played Ismene, the page in *Mithridates*. Not long after this she married George C., a barrister, but they separated very soon after their marriage. She joined Garrick in 1746 and remained with his company until 1769. She won recognition as a comedy actress by her performance in *The Devil to Pay*, 1731. She took part also in some oratorios, possessing a fine, well-trained voice.

Clive, Robert Clive, Baron (1725-74), Indian administrator, came of an old Shropshire family. Many stories are told of his schooldays, which go far to prove that in this case the boy was father of the man. Though dull at books, he was notorious for reckless courage; and there is the tradition, most delightfully prophetic, that as a lad he formed a small army of boys and levied a tax on the shopkeepers of Market Drayton, which they paid lest otherwise their windows should be broken. In his eighteenth year he received the offer of a writership in the Honourable E. India Co.'s service at Madras, an opening which, needless to say, was as welcome to him as to his parents. He scented adventure in the E., adventure that was to come surely enough, though not quite so soon as he expected. The outward voyage was unduly protracted, and he did not arrive at his destination until late in 1744. The long delay had swallowed up the contents of a meagre purse, and he reached Madras in debt. In that city he knew no one, and was far too shy to take advantage of such opportunities to make acquaintance as did occur. Loneliness and the slenderness of his resources made him so miserable that after a few months' sojourn in India he decided to commit suicide, and he desisted only when he had pointed a pistol at his head and twice pulled the trigger without obtaining the desired result. He then examined the weapon, and finding that it was properly loaded, he put it aside, remarking that it was evident from this intervention of providence that he was intended for something great. Fate

did not keep him waiting long. In 1746 Labourdonnais captured Madras, and among many took C. prisoner. The young man escaped, however, to Fort St David. He now desired to abandon the civil and enter the military side of the company's service, and he applied for, and in 1747 obtained, an ensign's commission. Though he had had no previous training in arms, he showed signs of military genius, and elicited the commendation of Maj. Lawrence. A treaty of peace between England and France was signed at Aix-la-Chapelle in Oct. 1748, and C. returned to



ROBERT CLIVE

his former occupation. He was not destined long to remain at his desk. He was given a command, again under Maj. Lawrence, in the expedition against the Rajah of Tanjore, during which he showed the same bravery that he had previously displayed in the unsuccessful siege of Pondicherry. After the conclusion of this campaign he was appointed commissariat officer to the Brit. troops, and shortly after was promoted captain. He submitted in 1751 a plan for the capture of Arcot, the cap. of the Carnatic, and was, to his great delight, permitted to endeavour to carry it out. He occupied the tn, and held it for 2 months, with his 500 men, of whom only 200 were English, against an army of 10,000. At the end of that period the enemy retired. The defence of Arcot, Malleon, the military historian, has said, may be regarded as 'the turning-point in the eastern career of the English.' Though not at the time regarded as so important as, in the light of subsequent events, it is now, C.'s defence made a great reputation for him, which was enhanced by his later achievement in the campaign. C. was in 1753 invalided home, and was welcomed

by the court of directors of the E. India Co., who, as a token of the high esteem in which they held him, presented him with a very valuable sword mounted in diamonds, which, very properly and modestly, he declined to receive unless a similar mark of honour was bestowed upon Maj. Lawrence. He returned to India in 1756, and, after serving for a short time in Bombay, went to Madras, where the news came that Suraj-ud-Dowlah had captured Calcutta and imprisoned the Eng. captives in the Black Hole (q.v.). C. went forth to retake Calcutta and to avenge the victims of the outrage. He defeated Suraj-ud-Dowlah at Plassey (23 June 1757), and dethroned him in favour of Jafar Ali. From 1757 C. was Governor of Bengal until 1760, when he returned to England where he was received as a popular hero by everyone, from the king to the mob. He was elected member of Parliament for Shrewsbury, and in 1762 was created Baron C. in the Irish peerage. Two years later he went out as Governor of Bengal to put the administration on a sound footing. This he did, but in 1766 he had to return owing to ill health. In England he was attacked for having abused his position, and many charges were brought against him. A parl. inquiry was held, and the House of Commons unanimously accepted a resolution that he had rendered 'great and meritorious services to the State.' He d. by his own hand, after long suffering severe bodily agony, on 22 Nov. 1774, at the age of 49. C. no doubt often acted in a way that in a 20th-cent. official would be regarded as little less than criminal; thus he accepted vast sums from native princes, but that was the custom of his day, when the Englishman in India was not as a rule, and was not expected to be, very scrupulous as to the manner in which he acquired a fortune. On the other hand, he was a just administrator, a great ruler, and a brilliant soldier; and he it was who securely laid the foundation of the Brit. Empire in India. See Sir J. Malcolm, *The Life of Robert, Lord Clive*, 1836 (reviewed by Macaulay, 1840); C. Wilson, *Clive*, 1890; Sir G. W. Forrest, *Life of Lord Clive*, 1918; R. J. Minney, *Clive*, 1931.

Cloaca, in zoology, is the name given to the common chamber in some vertebrates into which open the alimentary canal, the genital and urinary ducts; it is present in all amphibians, birds, and reptiles, in the monotremes and some fishes. In higher mammals the urinogenital orifice and the anus take the place of the C.

Cloacae, sewers of anc. Rome. The fact that Pliny called the city 'urbs pensilis' (hanging) shows to what an extent they undermined it. Ruins of many still exist, of which the most famous is the Cloaca Maxima, built in about the 6th cent. bc to drain the forum which stood on marshy ground between the Palatine and Capitoline hills, and barrel-vaulted a cent. or two later. It is 14 ft high and 10½ ft wide. Under the rep. C. were supervised by the censors; under the empire by the *curatores cloacarum*.

Cloche Gardening, system of using

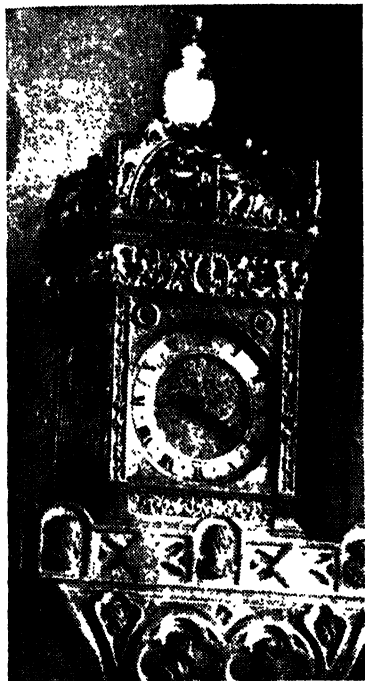
cloches, bell-glasses, and hand-lights out of doors to give protection to plants from adverse weather conditions and hasten their growth to maturity. The appliances used may be of glass or plastic, and are valuable in obtaining crops or flowers early in the season, and to prolong the season in some cases.

Clock, time-telling instrument in which energy is stored, either by winding up a weight or a mainspring or by some other contrivance, the energy being then released in regular fashion and in such a way that a hand or hands will record the passage of time on a dial. There is very little authoritative information as to the progress of horology (q.v.) from the early years of the Christian era right down to the 14th cent.; and this is much to be regretted, for at some time during that period the C. evolved from a more or less elaborate clepsydra (q.v.) into a mechanism driven by weight. Nothing definite is known as to when or by whom the mechanical C. was invented, but we may safely assume that it developed gradually as the outcome of many experiments by a large number of people. There are many early references to 'horologes' in all parts of Europe. In England, for example, records of the year 1286 speak of a 'horologe keeper' at St Paul's Cathedral. There is also mention (c. 1298) of a 'horologe' being fixed in a turret opposite Westminster Hall. Between 1292 and 1313 both Canterbury and Exeter Cathedrals are reputed to have possessed 'horologes.' The 'horologe' at Glastonbury Abbey was supposed to have been made by Peter Lightfoot, a Benedictine monk, c. 1335; but he is now regarded as a legendary figure. In early times, however, all time measurers were indiscriminately described as 'horologes,' whether they were sundials, water C.s, or sand glasses.

Until comparatively recently it was believed that C.s operated by wheels and weights, and controlled by some form of escapement, had begun to make their appearance in monasteries in Europe during the 11th cent.; but so many vague and contradictory records exist that any attempt to fix the exact date of their introduction would be mere guess-work. That such C.s were set up first in monasteries and churches is more than probable. In the Middle Ages, the monastic houses were the prin. repositories of the arts and sciences, and the monks would have found a mechanically sounded bell a valuable aid to their observances. It may well be that a train of wheels, actuated by a weight and controlled by some slowing-down device, and made for just such a purpose, preceded the escapement for timekeepers, and possibly even suggested the application of the same sort of contrivance for controlling a machine to show the time.

The word 'clock' is derived from the Lat. *clocca*. Other equivalents are the Saxon *clugga*, the Fr. *cloche*, and the Teutonic *glocke*—all signifying a bell. The first mechanical C.s had no dial, but were purely for the purpose of striking a

bell to denote the time at each hour. Strictly speaking, a C. that does not strike is known as a timepiece. According to the late G. H. Baillie, who did much original work in accumulating documentary evidence connected with horological hist., the weight-driven C. was unknown until about 1300. About that time its use spread steadily across Europe from Italy, but did not reach England



*Reproduced by gracious permission of
Her Majesty the Queen*

ANNE BOLEYN CLOCK

The ornamental case of copper gilt is in a fine state of preservation.

until about 1386. He considers that all prior records referred to water C.s and *not* to weight-driven, escapement mechanisms, which had hitherto been assumed to exist all over Europe from the 13th cent. onwards.

The making of C.s in England was started by 'three horologists from Delft in Holland' to whom in 1386 Edward III granted a patent or passport giving them leave to stay in England for the purpose of carrying on their craft. The earliest C.s were made for churches and public buildings, and as their size decreased they became more suited for domestic

use. The earliest Eng. turret C.s still in existence were installed at Salisbury Cathedral, Wells Cathedral, and Dover Castle. The Salisbury and Wells C.s are attributed to the early half of the 14th cent., not long after the temporal hours of unequal length had been superseded by the system of dividing the day and night into 2 periods each of 12 hrs of equal duration. The Dover Castle C. is perhaps the most interesting, since it still has its original escapement. A good example of clockmaking in its earliest and simplest form, it is now one of the exhibits at the Science Museum, S. Kensington.

The Salisbury C., which has been 'modernised' from time to time during its long life, was restored to its original condition in 1956 and set up in a position inside the cathedral, where it can now be seen working.

General construction of clocks. The frame of an ordinary C. usually comprises 2 brass plates, held apart at the appropriate distance by 4 pillars. The driving force may be either a weight, a spring, or electricity. The simplest and most reliable form of driving force is provided by a *weight* suspended from a *line* which is wound round a *barrel*. The pull of a weight acting in this way is practically constant, since it relies upon *gravity* for its power. Moreover, with a reasonable distance of fall for the weight, and by the employment of suitable pulley arrangements, the mechanism can be made to go for a convenient period with one winding. The great disadvantage is that a weight-driven C. is not portable. Hence, generally, only long-case, or 'grandfather' C.s, are weight driven. In bracket C.s, and many of the smaller C.s now available, the driving force takes the form of a mainspring (see WATCH). The latter is a thin ribbon of steel, coiled up, frequently in a barrel, round an arbor to which one end of the spring is attached, the other end being anchored to the wall of the barrel. No barrel is provided in cheap alarm C.s, in which the outer end of the spring is anchored to one of the pillars. C.s can be made to go for a day or a week with one winding; sometimes for much longer periods. Winding is accomplished by means of a key which winds the line on to the barrel, or alternatively energises the mainspring. A ratchet and click, or pawl, is provided to prevent the wheels from turning backwards.

Of the wheels and pinions that constitute the gearing, there is one 'set' pivoted between the plates; this is called the *train*, or more correctly the *going train*, since its function is to transmit the energy of the driving force to the escapement and thus to keep the movement going. Another 'set' is planted, usually on the front plate; this is known as the *motion work*, and it comprises an ingenious 12/1 reduction in which the axes of 2 wheels, carrying respectively the hour and minute hands, turn at the correct speeds, concentrically and in the same direction. Sometimes, a one-stage reduction is used; in modern C.s and in all watches a two-stage reduction is employed.

The great wheel is mounted on the same arbor as the barrel; suitable ratchet and click work is provided to enable the barrel to be turned when winding, while the wheel itself does not turn. The great wheel gears with the centre pinion, on which the centre wheel is mounted. The centre arbor turns once in an hour; it is extended through the front plate and carries the cannon pinion to which the minute hand is fixed. The cannon pinion is mounted on a pipe, which bears the centre arbor, and a friction spring ensures



*Crown Copyright: Science Museum,
London*

MODEL SHOWING GALILEO'S APPLICATION OF THE PENDULUM

that it will be carried round with the arbor; but the spring is not too strong to prevent the hands being turned independently when setting the C. to time. The hour wheel, which turns once in 12 hrs, is mounted on another pipe carrying the hour hand, and bearing on the pipe of the cannon pinion. The centre wheel gears with the third pinion, on the arbor of which the third wheel is mounted. This gears with the escape pinion, and the escape wheel is mounted on its arbor. In modern 8-day spring-driven C.s there is an intermediate wheel between the great and centre wheels to allow for an 8 days' run with 1 winding. The wheels are made of hard brass; they are cut or hobbled on gear-cutting machines. The pinions are of steel; in the best work they are hardened, tempered, and highly polished.

It should be noted that there is a fundamental difference between the gearing in a

C. and almost every other machine, in that the gearing is stepped up from the great wheel, which generally turns once in 12 hrs, to the escape wheel which, in a grandfather C., usually turns once in a minute. Special tooth forms are required—the gearing is known as cycloidal as against the more usual involute form used in most machinery.

The escapement is the device which controls the driving force. Its primary function is to release and then arrest the train at regular intervals of time; its secondary function is to impart impulse to the controller, which is generally either a pendulum or a balance and spring. The time of swing or oscillation can be and, in fact, is predetermined. In a grandfather C. it is 1 sec.; in an ordinary modern watch it is $\frac{1}{4}$ sec. Hence, gearing can be so arranged that one wheel will turn once in a minute, another once in an hour, and another once in 12 hrs.

The escapement employed in the earliest mechanical C.s, like the Dover Castle C., was that known as the verge escapement. Exactly when and by whom it was invented is unknown, but it was commonly used in one form or another in C.s until after the middle of the 17th cent. and in watches for more than 100 years after that. The controlling device in the earliest verge escapement is a horizontal bar, called a foliot, mounted centrally on an arbor, called the verge, provided with 2 pallets which alternately release and lock the teeth of the escape wheel. The foliot swings to and fro and at each swing one tooth of the escape wheel is permitted to escape. A small movable weight is suspended from each end of the foliot for the purpose of regulating the period of swing. Moving these weights nearer to the centre causes the foliot to swing at a quicker rate; moving them outwards causes it to swing more slowly. The foliot as a controlling device was far from satisfactory; it had no natural period of swing. It was also sensitive to variations in the power of the driving force transmitted through the train to the escape wheel, and these variations were often great, chiefly owing to inaccuracies in the gearing. As a result, the period of swing was very variable, and only a crude regulation was possible by moving the weights on the arms of the foliot. The correct principles of toothed gearing were not understood until the 18th cent., but before that time great improvements in timekeeping became possible as a result of the discovery of the properties of the pendulum and its application to C.s.

Galileo (q.v.), when a youth of 17, watching the swinging of the great lamps in the cathedral of Pisa and timing the swings by counting his own pulse beats, observed that they appeared to take just the same time to swing through a small arc as for a large one. This property of describing either large or small arcs in equal periods of time is known as isochronism (from the Gk *isos*, equal; *chronos*, time). Galileo's deductions that the large and small swings were isochronous is not absolutely correct, but it is very nearly

true for all arcs of swing of a pendulum under about 3° . This is the reason why the swing of the pendulum in a high-class C. is kept as small as possible, often about 2° or even less. Slight variations in the arc do not then affect the timekeeping very much. If it is large, however, small changes in its size will make appreciable variations in the time of swing. In his later years Galileo made many experiments with the pendulum, but apparently they all necessitated manual operation. When an old man and blind, in collaboration with his son Vincenzo, he devised plans for a pendulum C., but it was not finished in his lifetime.

It was left to others to bring the possibilities of Galileo's discovery to fruition. Although three-quarters of a cent. elapsed before the first pendulum-controlled C. saw the light of day, it can be stated that following the invention of toothed wheels and then the verge escapement, *accurate* timekeeping was first made possible as a result of the discovery of the properties of the pendulum and of its subsequent application to C. work. The first successful application of a pendulum in an actual C. is often credited to the Dutch physicist, Christian Huygens (1629-95), who, on Christmas Day 1656, completed his first pendulum C. In this the escapement was the original verge, but now controlled by a pendulum instead of a foliot. The arc of swing was large (about 30° - 45°), and it was only possible to use short and light pendulums. Hence, Huygens's application of the pendulum, important as it seemed to be in a theoretical sense, and bringing about, as it did, some improvement in timekeeping, did not solve the problem of making a C. keep really accurate time. Pendulum C.s on Huygens's system were first made in England in 1658 by Ahasuerus Fromanteel on the Bank Side in Moyses Alley, Southwark, and at the sign of the Mermaid in Lothbury near Bartholomew Lane End, London.

Eng. C. makers soon realised that the timekeeping of pendulum C.s could never be really accurate unless the pendulum arc could be made quite small. They went right to the heart of the problem and accomplished the desired object by designing an entirely new escapement, in which the arc of swing of the pendulum could be made a few degrees each side of the line of centres. The horizontal wheel of the verge escapement was abandoned and replaced by a vertical, flat wheel with saw-shaped teeth, controlled by pallets at either side of a curved piece of steel, the shape of which was rather like an anchor. This came to be known as the *anchor escapement*. The practical result of being able to keep the arc of swing small was that the vibrations of the pendulum were very nearly isochronous. It was also convenient to use long and relatively heavy pendulums, the vibrations of which were much less subject to accidental disturbances than was the case with short and light pendulums; furthermore, a heavy bob is not so likely to be influenced by irregularities of the train. It soon

became the practice to use a seconds pendulum in long-case C.s, whether for domestic or scientific purposes. Thus, the main difficulties were overcome at one stroke, and for the first time it became possible to take real advantage of the valuable properties of the pendulum as a controller for C.s, and to secure timekeeping accurate to seconds per day instead of minutes. The anchor escapement laid the foundation for all progress towards precision timekeeping by pendulum C.s. Its inventor is not definitely known. Until recently it was attributed to Dr Robert Hooke (q.v.), but there appears to be no direct evidence for such an attribution. The first C.s, with the anchor escapement are believed to have been made by Wm Clement of London, c. 1670, and it is quite possible that it was actually his invention. The earliest known anchor escapement C. by Wm Clement, dated 1671, was made for King's College, Cambridge; it is now in the Science Museum, S. Kensington. The anchor escapement comprises escape wheel, and pallets secured to the pallet arbor, to which an arm called the crutch is fixed at right angles, terminating in a fork or loop to embrace the pendulum rod. The action is simple. As the pendulum swings in either direction, it carries the crutch with it and this causes the pallets to oscillate. One is raised clear of the teeth of the escape wheel, while the other is lowered into the path of the teeth on the opposite side of the wheel. The driving force is trying all the time to make the wheels turn, and, as the first pallet is being raised, the escape wheel is permitted to start moving. As it does so, it pushes the pallet out of the way and this action gives impulse to the pendulum through the crutch. When the tip of the tooth clears the discharge corner of the pallet, the escapement is unlocked and the wheel moves freely through a short distance until a tooth on its opposite side drops on to the face of the second pallet; this locks the escapement. It is the drop of the tooth on to the pallet that gives the audible 'tick' of the C. As the pendulum continues to swing after a tooth has been locked, the pallet is driven further into the space between 2 teeth of the escape wheel and this causes a slight recoil, or in other words the wheel is forced to turn backwards slightly. Because of this, the anchor escapement is also known as the *recoil escapement*. When the pendulum commences its return swing the cycle is repeated. With only slight modification, the anchor escapement is still found in all moderately priced pendulum C.s made to-day.

About 1720, George Graham (q.v.) invented the *dead-beat escapement*, which marks one of the most important steps in the progress of horology. The Graham dead-beat escapement is an improved form of anchor escapement, to which it is somewhat similar both in appearance and action; but there is no recoil because the locking faces of the pallets are arcs of circles struck from the pallet arbor. Graham aimed at more accurate timekeeping

as a result of eliminating unnecessary resistances, still further reducing the arc of vibration of the pendulum, and superior workmanship. This escapement was used in astronomical clocks for nearly 200 years, until superseded by the free pendulum.

Pendulum. The length of a pendulum is directly proportional to the square of the time of swing. The theoretical length of a seconds pendulum—i.e. from centre of suspension to centre of oscillation—is approximately 39.14 in., and of a half-second pendulum approximately 9.78 in.

Compensation. A compensation pendulum is one which will maintain constant length between the centres of suspension and of oscillation in all varying changes of temp.

When pendulums were first applied to C.s, although a great improvement on the foliot, the variation in timekeeping, resulting from primitive gearing and the interference set up by the verge escapement with its short pendulum, was considerable, far greater than any likely to be caused by changes of temp. The invention of the anchor escapement and the introduction of the seconds pendulum produced a standard of timekeeping incomparably better than had been possible hitherto. Nevertheless, clockmakers and physicists of the period were unable to account for variations in rate that were still apparent. The invention of the dead-beat escapement, which greatly reduced escapement disturbance, thereby making an improved rate possible, enabled Graham to detect the effects of changes of temp. on the swing of the pendulum, and to compensate for the errors thus set up he conceived the idea of providing a jar filled with a quantity of mercury as a pendulum bob. He set up 2 C.s in an attic, facing S., where the daily extremes of temp. both in winter and summer would be experienced at their greatest, one fitted with an ordinary pendulum and the other with a mercurial pendulum of this nature. After a trial extending over about 4 years he found that the mercurial pendulum maintained a much superior rate, and that adequate compensation for temp. changes could be achieved, provided the quantity of mercury of the jar was right. He communicated his invention to the Royal Society in 1726. Many mercurial pendulums have been made. In some bracket C.s there is a double jar instead of a single one. The close adjustment of a mercurial pendulum, however, is a tedious business, and other, more simple, methods were also attempted.

Some time before 1727 and working quite independently of Graham, John Harrison (q.v.), contrived what is generally called the *grid-iron pendulum*, which consists of 9 rods, 5 of steel and 4 of brass. It takes advantage of the different coefficients of expansion of the 2 metals. The sev. rods are so arranged that the steel rods expand downwards in heat, tending to increase the length of the pendulum, while the brass rods expand upwards. The lengths of the 2 materials

are calculated so that the downward expansion of the steel will be compensated by the upward expansion of the brass.

Many other compensation pendulums have been introduced using the same principle. Some have been made by using concentric tubes of steel and brass or zinc. The modern method of compensating for temp. errors is to use pendulums made of materials which have such small coefficients of expansion as to require very little compensation. The material generally used to-day for pendulums of this nature is the alloy called *invar* (short for *invariable*), which consists of 36 per cent nickel, 59 per cent iron, 4 per cent manganese, and 1 per cent carbon. The original *invar* alloy was developed in France, c. 1900, by Dr Charles-Edouard Guillaume; Brit. alloys are now available.

Maintaining power. In high-grade C.s, or where more than usual accuracy is required, maintaining power must be provided to keep the C. going during the process of winding up. The earliest form of maintaining power is known as Huygens's endless rope, in which the weight is hung on a rope or, more recently, a chain between 2 pulleys with suitable spikes to hold the rope or chain, one of which is fixed to the main arbor and the other is provided with ratchet or click and is secured to the frame. Half the power of the weight is thus always being exerted on either side of the rope. Pulling on the endless rope, after it has passed over the second pulley, raises the weight without taking the power off the great wheel. The most usual form, invented by John Harrison, was that in which connection between the great wheel of the C. and the winding arbor is maintained by means of a subsidiary spring. This latter is always kept under tension while the C. is going; but immediately winding starts, it automatically comes into action by a click acting on a ratchet on the great wheel, and its force is sufficient to keep the C. going while winding proceeds. The going barrel employed in modern C.s and watches requires no maintaining power, since the mainspring is wound from the arbor end and exerts its power from the barrel end. Thus, the act of winding does not remove the power from the great wheel.

Electric clocks. The first electric C. was made by Alexander Bain, an Edinburgh clockmaker who settled in London. He devised and made many different types, and from his inventions many of the modern electric C.s developed. None of his C.s was entirely successful because of bad contacts, improvements in which were to come with the introduction of better materials.

In 1894, Frank Hope-Jones and George B. Bowell invented a system whereby a pendulum could be maintained in motion by an electric battery, being given an impulse every half-minute by a gravity arm, released by the pendulum and restored by the current. At the same time, an impulse could be sent to any number of secondary or impulse dials, for each of

which an additional 1 to 1½ volts was used. By this system a master C. can control any number of impulse dials, giving the same time in any required number of places. Many municipal buildings, railway stations, and the like employ this Master C. System.

In 1922 Wm Hamilton Shortt invented a free pendulum, the accuracy of which was such as to enable astronomers to detect slight variations in the speed of rotation of the earth. The first free pendulum was installed at the Edinburgh Observatory. The principle is that an electrically driven pendulum, which is used to show the time, gives impulse to an otherwise entirely swinging pendulum. The free pendulum then corrects the slave pendulum by means of electric contacts and a device known as the 'hit and miss synchroniser.' Until just before the Second World War the Shortt Free Pendulum was used as the standard C. in most of the observatories throughout the world. It has now been superseded by the quartz crystal C.

In 1918 H. E. Warren, in the U.S.A., invented the synchronous electric C., which relies on pulses of alternating current for its power. With the advent of the grid scheme in Britain the alternations of the current were time-controlled at 50 cycles per sec. Since 1930 synchronous C.s, which are merely plugged in to the mains, have been produced in large quantities. They are really electric meters counting out the number of alternations of the supply, and, by means of suitable reduction gearing, showing the time of day on a conventional dial. A synchronous C. must conform to the alternations of the current. It cannot go either faster or slower. Hence so long as the alternations are time-controlled a synchronous C. cannot gain or lose. The control at the power station is effected by means of a frequency control meter, comprising a very accurate pendulum C. showing Greenwich Mean Time and checked at frequent intervals, and a synchronous motor C. showing the time being produced by the station. By observing the 2 sets of hands the engineer in charge can either speed up or slow down his generator. It sometimes happens in peak periods that the alternations will drop off, causing the C. to go slow, but any such errors are corrected in the power station, generally at night, so that the C. is brought to exact time at least once every day. It has no cumulative error like an ordinary mechanical C. Moreover, since it is geared down, larger pivots and bearings, also heavier oil or even grease can be used, and since it has neither escapement, mainspring, nor weight, wear is less than in an ordinary C. One of the disadvantages is that, should the current fail for any reason, the C. will stop. Some are made with self-starting motors, which will start up immediately the current is restored, but showing the wrong time. Others need to be manually restarted.

Many modern electric C.s have a more or less conventional movement, driven by a spring which is rewound electrically

every few minutes; an ordinary torch battery will keep such a C. going for upwards of a year. In others, the pendulum or balance is driven by electricity, and in turn drives the train.

Striking and chiming clocks. The method now employed in striking C.s was invented in 1675 by Edward Booth, who later changed his name to Barlow. An entirely separate train of wheels, operated by its own driving force, is required. Its object is to raise the hammer and then release it to strike on the bell or gong. Mechanism for locking and releasing the striking train and counting the number of blows to be struck is also provided. The striking train is released by the going train, and only comes into action when the C. is about to strike; it locks itself after the appropriate number of blows has been struck. The mechanism controlling the striking work is planted on the front plate of the movement behind the dial. It comprises a series of levers, which are raised by a pin on the minute wheel, or cannon pinion; a rack provided with a number of teeth, and a snail-shaped cam mounted on the hour wheel of the motion work, divided into 12 steps, each of which is progressively deeper from the highest to the lowest, which together determine the number of blows to be struck. As the C. goes, the levers are raised, and the rack is released so that its tail falls on one of the steps of the snail. This liberates the number of teeth on the rack to correspond with the hour to be struck. At the precise hour the levers drop off the pin on the motion work and this unlocks the striking train; one blow is struck for each tooth of the rack that was liberated and which is now 'gathered' by the striking train. When all the teeth of the rack have been gathered, the striking train locks itself ready to be released at the next hour (or half hour as the case may be).

Quarter-chiming work for domestic C.s was first introduced c. 1630, both hours and quarters being sounded upon bells. Circular gongs were first made in about 1830, and the type of straight rod gong now almost universally employed in chiming C.s was invented c. 1890. A third train is necessary in a chiming C., similar to the striking train. The going train discharges the chiming train which, in turn, discharges the striking train after completing the chimes at the hour. Usually, there is a 'self-correcting' device to ensure that the quarters will always be chimed in the correct sequence.

The most popular chime tune is the 'Westminster,' as chimed by the great C. at the Houses of Parliament, generally known as 'Big Ben,' although strictly speaking that is the name given to the 13-ton bell upon which the hours are struck, and which is named after Sir Benjamin Hall, First Commissioner of Works at the time of its installation (1860) (see GRIMTHORPE). The chime was originally composed for the C. at Great St Mary's Church, Cambridge; it was developed by Dr Crotch and Dr Jowett from a phrase in Handel's 'I know that my Redeemer liveth.'

Most striking and chiming C.s have a device whereby they can be silenced at will. Many have alternate chimers. Some old Eng. C.s, notably by Joseph Knibb, struck the Rom. numeral equivalent to the hour on 2 bells. In this the 'I' of the Rom. number is struck on a higher pitched bell, while the 'V' is struck on a lower pitched bell. 'X' is represented by 2 successive blows on the lower pitched bell. C.s are also made to strike ship's time.

Romans to the Etruscans, who released her on account of her bravery. She was allowed also to choose other hostages for release, and she chose the youngest. A statue was erected to her in the Via Sacra.

Clog Almanac, anct kind of calendar, usually made of wood, though sometimes of metal. It was square in shape, and on it were notched the months and the days with special marks for saints' days. It was supposed to have originated in Denmark.



THE CLOISTERS OF ST JOHN LATERAN, ROME

Anderson

Alarm clocks. The alarm C. has a separate train for the alarm mechanism, which is set by means of a hand in connection with a small dial. The alarm mechanism is held locked by the going train until the appropriate time, when it is released to ring the alarm until silenced or run down.

See also CHRONOGRAPH; CHRONOMETER; HOROLOGY; WATCH. See F. J. Britten, *Watch and Clock Makers' Handbook*, 1896; G. H. Baillie, *Watches*, 1929; J. D. Robertson, *The Evolution of Clockwork*, 1931; J. E. Haswell, *Horology*, 1937; D. de Carle, *British Time*, 1947, and *Watchmakers' and Clockmakers' Encyclopaedic Dictionary*, 1950; G. F. C. Gordon, *Clock-making, Past and Present* (2nd revised ed. by A. V. May), 1949; T. P. Camerer Cuss, *The Story of Watches*, 1952.

Clodius, see CLAUDIUS, PUBLIUS.

Clodius, Allinus, see ALBINUS.

Clodia, Rom. maiden sent as a hostage to Persena. After escaping by swimming the Tiber she was sent back by the

Clogheen, tn of Rep. of Ireland in the co. of Tipperary, about 13½ m. WSW. of Clonmel, at the N. end of the famous 'Vee' road. Pop. 700.

Clogher, vil. of co. Tyrone, N. Ireland, near the S. border of the co., the original cathedral tn of the diocese. F.M. Viscount Alexander was b. in the C. valley. Pop. 300.

Clogs, shoes worn by peasant people in sev. countries of the Continent, and also used in the N. of England and parts of Scotland and Wales. The uppers are of leather and the soles are made of wood.

Cloister (Lat. *claustrum*, an enclosure; Fr. *cloître*), quadrilateral space, surrounded by an ambulatory or covered passage to shelter from rain, etc., attached to monastic buildings and cathedrals, and often also to colleges. The C. was usually built on the S. side of the church, so as to benefit by the sunshine. Canterbury, Chester, and Gloucester have fine examples of Benedictine C.s. In the

Middle Ages the church was on one side of the ambulatory and the refectory on the side opposite, whilst E. and W. were the chapter-house, larders, and cellars. Almost invariably the dormitories were on the upper storey. On the side skirting the quadrangle pillars and arches, sometimes decorated with elaborate carving and delicate-patterned traceries, supported the cloistral roof, which was often vaulted. At Gloucester, the exquisite fan-traceried vaulting is still in perfect preservation. Besides walking daily in the C.s for recreation—from the ambulatory at Mont St Michel they could see on all sides the great Atlantic—the monks used also to hold schools for novices and to paint, carve, and read theology in the recesses or stalls on the inner side. Here, too, they could talk at certain hours. The central space was usually occupied by a square grass-plot, as at Westminster Abbey. Among many beautiful C.s still in existence may be cited those of St John Lateran at Rome, of Monreale in Sicily, and of the Campo Santo at Pisa, where the spacious ambulatories are actually 4 in number.

Clonakilty, seaport and mkt tn on C. Bay in SW. of co. Cork, Rep. of Ireland. It is the terminus of a branch of the Cork, Bandon, and S. Coast Railway, and has flax and mineral water industries. Michael Collins (1890–1922) was b. in C. Pop. 2865.

Clonard, vil. of co. Meath, Rep. of Ireland, 16 m. SW. of Trim, where the great monastic school of C., renowned throughout Europe in the Middle Ages, was founded by St Finian in the 6th cent.

Clone (from Gk *klōn*, a twig, spray, or slip of a plant chosen for propagation), a term applied to a group of plant progeny vegetatively produced of a single individual plant, and having the same genetical constitution.

Clones, tn of Rep. of Ireland, in the co. of Monaghan. It possesses the ruins of an old abbey. Pop. 2400.

Clonfert, par. and tn on the Shannon and the Grand Canal, in the SE. of co. Galway, Rep. of Ireland. Pop. 1633.

Clongowes Wood College, Naas, co. Kildare, Rep. of Ireland, secondary boarding school for boys, founded in 1814. It was the first stable Jesuit College in Ireland. There are now 360 boys in the college, and courses prescribed by the Irish Dept of Secondary Education are followed.

Clonmacnois, vil. of co. Offaly, Rep. of Ireland, one of the most celebrated of Ireland's holy places. The monastic city fl. from AD 548 for 1000 years until its despoliation by the Eng. garrison of Athlone. See P. C. Molloy, *Guide to C. Pop.* 925.

Clonmel, municipal bor. and co. tn of co. Tipperary, Rep. of Ireland, on the Suir. It is a tourist centre, and is famous as the bp. of Sterne. Formerly the centre for Bianconi's system of jaunting cars (1815). Besides exporting agric. produce it has tanneries and flour-mills. Pop. 10,500.

Clontarf, residential dist. of the city of

Dublin, Rep. of Ireland, incorporated under the Dublin Corporation Act, 1900.

Clonus, involuntary, rapid, alternating contraction and relaxation of antagonistic pairs of muscles. See also under **RFLEXES**.

Cloots, or **Clootz**, Jean Baptiste, Baron von (1755–94), Fr. revolutionary, b. at Gnadenthal near Cleves, Rhineland. He was of Prussian nationality, and took a prominent part in the affairs of the Fr. Revolution. After travelling in Europe he went to Paris in 1789, on the outbreak of the Revolution, and joined the Jacobin Club. He renounced his title, and took the name of 'Anacharsis C.' In 1792 he became a Fr. citizen, and became notorious for his denunciations of religion. But he made an enemy of Robespierre, and was guillotined during the Terror.

Close (Lat. *clausum*, shut), in England, an enclosed space forming the precinct of a cathedral or monastery. In Scotland and in colloquial English the word is used for a narrow passage leading to a block of tenement houses, to the entrance of a court, or from a main street.

Close-hauled, term applied to the general arrangement of the sails of a ship when she is travelling as near as possible to the direction of the wind. Square-rigged vessels when C. make a small angle with the line of the wind's direction, but cutters and luggers can sail very much nearer to it.

Close Times, those seasons of the year during which, by law or by mutual agreement, game, wild birds, salmon, certain animals, and certain fish may not be shot or caught. These C. T. vary to a certain extent in different countries and localities, but they will generally be found to include the breeding or spawning times of the species in question. In most cases the C. T. in Great Britain are fixed by the game laws and a series of Wild Birds Protection Acts, of which the chief were passed in 1880, 1904, and 1908, but in some cases sportsmen are ruled by unwritten but equally binding rules. There are, for example, no statutory C. T. for foxes and rabbits, but in practice there is no fox-hunting from April till 1 Nov. Unwritten law likewise fixes the deer-hunting period for stags from about 12 Aug. to 12 Oct., and for hinds from 10 Nov. to the end of Mar. An Act of 1892 prohibits the sale of hares or leverets caught in Great Britain from Mar. to July, under penalty of a heavy fine, and this has the effect of creating a close time. In Ireland this period is fixed from the beginning of April to 12 Aug.

In England and Wales hares, rabbits, woodcock, snipe, quail, landrail, and heath or moor game (and the eggs of swan, wild duck, teal, and widgeon) are protected under the game laws, though no close time is fixed for them by those laws. In Scotland the same remarks apply to deer and hares, to the first 4 birds, and to wild duck. The close time for all wild birds in Great Britain, under the Wild Birds Protection Acts, 1880 to 1939, is from 2 Mar. to 31 July (inclusive), and certain eggs are also protected under the same Acts.

The game laws fix the following close times for various kinds of game, all dates inclusive: black game or heath fowl, 11 Dec. to 19 Aug. (in certain parts 31 Aug.); grouse, 11 Dec. (10 Dec., Scotland) to 11 Aug. in all parts of the U.K.; ptarmigan, in England none, in Scotland 11 Dec. to 11 Aug., in Ireland 11 Dec. to 19 Aug.; partridge, 2 Feb. to 31 Aug. throughout; pheasant, 2 Feb. to 30 Sept. throughout. Christmas Day and all Sundays are C. T. for game. In Ireland male deer are protected from 1 Jan. to 9 June, fallow deer from 29 Sept. to 9 June, hares from 20 April to 12 Aug., landrill from 11 Jan. to 19 Sept., and quail from 11 Jan. to 19 Sept. In England and Scotland the 2 last-named come under the Wild Birds Protection Acts already referred to. Otter-hunting lasts from 15 April to 15 Sept. In addition to these general rules, provisions are made by the secretary of state by which protection may be granted to certain birds in particular localities at other times on application from the local authorities. The Salmon Fisheries Act, fixing the close time in England and Wales for nets from 1 Sept. to 1 Feb., and for rods from 2 Nov. to 1 Feb., has been varied considerably in different parts of the country, but it always begins for nets not later than 1 Nov., and lasts for a minimum of 154 days. For rods it must not begin later than 1 Dec., and the minimum period is 92 days. In Scotland the close time for salmon, usually lasting from 27 Aug. to 10 Feb. for nets, and from 1 Nov. to 10 Feb. for rods, must not be less than 168 days for nets.

There are also weekly C. T. in the British Isles, including Sunday, which vary from 24 to 48 hrs. The Fresh-water Fisheries Act of 1878 fixed a close time for fresh-water fish not caught in private waters from mid Mar. to mid June, except for certain specified parts of the country. Crabs and lobsters under a certain size (crabs 4½ in. across back, lobsters 8 in. in length) may not be sold, and protection is also given to soft crabs and crabs with spawn. The protection of oysters varies according to local regulations. A general close time for deep-sea oysters is fixed by the Fisheries Act of 1877 in Great Britain from 15 June to 4 Aug. There are game laws and various regulations for the protection of animals in most countries, sometimes of an extremely stringent nature.

Closed Shop, term, first used in America, to indicate shops or factories from which non-union labour is excluded at the insistence of trade-union workers. The guildsmen or craftsmen of the late Middle Ages vigorously insisted in England on the exclusion from their work of workers who were not of their crafts or guilds. In the U.S.A. (where there is no political levy) a C. S. is an industrial estab. in which the employer prescribes, as a condition of employment, that each worker shall belong to his appropriate trade union. Where 2 trade unions compete for the support of a craft, the union which is accepted as 'appropriate' is determined by a somewhat intricate process operated

by a Federal Board of Industrial Relations, a gov. body the like of which does not exist in Britain. The position of the employer is that the unions compel him to lay down the condition of union membership, and the board tells him which is the union, in each craft, to which a monopoly has been granted. In effect he acts as honorary treasurer of the monopoly union, deducting its subscriptions from the employees' wages. In Britain, theoretically at least, an employer insists only upon trade-union membership, leaving the employee free to choose his union. The effect of the C. S. is to compel men to associate with a movement which is quasi-political, to reduce the supply of labour in an industry, raise the wages of union labour, and make consumers pay higher prices than are necessary.

Closure, or **Clôture**, in parl. procedure a method of putting an end to a debate which compels the House to decide upon the matter under discussion. The C. was first authorised by the Urgency Rules of 1881, upon a motion to vest in the Speaker the powers of the House for the regulation of its business. The obstructionist methods of the Irish Nationalist members induced the House to carry the motion, which was afterwards permanently estab. by a standing order in 1882. That order provides that the opinion of the House may be taken forthwith upon any motion 'that the question be now put'; the C. may be moved either at the conclusion of a speech or whilst a member is addressing the House, and, in the latter event, it intercepts any motion which it was the Speaker's intention to submit. The Speaker (or chairman of ways and means has an absolute discretion in allowing a C. motion to be put; but in practice he intervenes where such a motion is in his opinion an abuse of the rules of the House or an infringement of the rights of the minority. Analogous to the C. are the motions 'that certain words in the clause stand part of the clause,' or 'that a clause stand part of (or be added to) the Bill'; such motions override all power of amendment. C. may also be moved at the moment for 'interruption of business'—that is, at the expiration of the time fixed for the transaction of certain business, when the Speaker adjourns the debate and vacates the chair to make his report to the House. Reflections on the vote of C. are out of order, as are also questions to ministers respecting C. The presence of more than 100 members is required to make the C. vote effectual, or 20 in the case of the C. being put in a standing committee. A far more drastic method of curtailing the length of a debate is that of C. by compartments, called also the guillotine. This is a device whereby a definite period or periods may be set apart by the rules of the House for the discussion of the various stages and portions of a Bill; at the expiration of each period of time the discussion is automatically closed, whether concluded or not, without the leave of the Speaker or chairman being required, and the majority in the House

carry that portion of the Bill. It was first used in 1887 on the occasion of the Common Law Procedure (Ireland) Bill; it was also used in the debates on the Home Rule Bill, 1893, and the Education Bill, 1902. From the return of the Liberals in 1906 it became a characteristic feature of parl. procedure. See PARLIAMENT.

Clotaire I (497-561), Frankish king, was one of the 4 sons of Clovis who, at his father's death (511), received his share of the kingdom, including the cities of Soissons, Cambrai, and Laon. By arranging for the murder of his brother's children he secured Tours and Poitiers in 524, and 10 years later, after the fall of Burgundy, acquired Grenoble. In fact his whole reign was one of annexations. At the death of Childebert, his brother, with whom he had warred against the Visigoths, he became King of all Gaul (558), and he also ruled over much of Germany and exacted tribute from the Saxons.

Clotaire II (d. 629), Frankish king, finally obtained the whole Frankish kingdom in 613. The many concessions he made to the nobility account for the comparative tranquillity of his rule.

Cloth, see CLOTH MANUFACTURE AND FINISHING; COTTON; FABRICS; TEXTILE.

Cloth Manufacture and Finishing. Woven cloth or fabric is made in looms which permit a long 'sheet' of closely spaced parallel warp yarns to be interlaced by weft yarn passing backwards and forwards from one side of the 'sheet' to the other, being directed under some and over others of the warp yarns according to the particular weaving pattern desired. The character of the fairly rigid structure thus produced is determined by the thickness of the yarns, their spacing in the warp and weft, and also by the type of fibre used—cotton, wool, silk, linen, regenerated cellulose and protein rayons, cellulose acetate, or the newer synthetic fibres such as nylon, Terylene, Orlon, Dynel, etc. Non-woven cloth such as wool felt having considerable industrial importance is made by processing a web of intermingled wool fibres under suitable conditions of pressure and moist heat to cause the fibres to matt together—no yarn is used. Of increasing importance is the production of non-woven or bonded-fibre fabrics, made by first preparing a web of intermingled fibres of almost any type, not necessarily including wool, but having evenly distributed among them a bonding agent which under appropriate conditions can be made active to cement the fibres loosely, together and thus give a relatively thick, soft, porous cloth. A much favoured method for bonding the fibres in this type of cloth is to intermix a suitable proportion of thermoplastic fibres, such as the synthetic or cellulose acetate fibres, and then cause these to become effective by heat and pressure, possibly assisted by treatment of the composite material with an organic solvent to render these bonding fibres tacky.

Following manufacture cloths have to

be inspected for faults which may then be corrected by hand. But even after such inspection the cloth is generally unsuitable for immediate use in the manuf. of clothing—the cloth as it comes from the loom is usually thready and harsh to handle and may be oily, stained, and dirty. It is thus usually sent forward for scouring, bleaching, dyeing, or printing, and finally finishing. Such treatment may make the cloth not only more attractive but also more useful and durable.

Cloth finishing. However the cloth may have been treated subsequently to weaving, finishing is the last important stage of processing, and there are many different forms of finishing. One form is concerned with modifying the compactness of cloth structure. It may consist of raising a pile on the fabric surface by suitable treatment with rollers covered with wire carding or teazles (usually the former), thus making the fabric soft and spongy, or it may consist of running the cloth between heavy rollers (these may be heated and subject to slip) to flatten it and give it a smooth lustrous appearance. Another method for compacting the structure of a cloth, particularly linen cloth, is that of pounding it with heavy wooden 'fullers' in a beetling machine. A schreiner finish involves running the fabric between a compressed paper roller and a hot steel roller engraved with skew parallel lines (250 to 300 per linear in.), thus giving it a very high lustre not attainable by any other method. An embossed finish is obtained similarly using a steel roller appropriately engraved.

The emphasis to-day is on finishing cloths so that the particular effect produced is fast to washing, and with cotton and viscose rayon cloths particularly success in this direction has been achieved by having a thermosetting resin (made from urea- or melamine-formaldehyde condensation products) present at the time of application of the finish and then running the cloth through a chamber where it is exposed for a few minutes to a temp. of about 150° C. to set and insolubilise the resin. Simple formation of such a resin in cotton and rayon cloth in this way can produce fast-to-washing crease-resist and shrink-resist finishes, it usually being necessary to apply a higher proportion, say 15 to 20 per cent. of resin to secure a useful degree of crease resistance. Embossed and schreiner finishes produced with the aid of a resin are fast to water, whereas without resin such finishes are easily washed out.

The new 'wash and wear' cloths which do not require to be ironed after washing, since they dry (in air) to their original state, are produced by resin finishing. Washable glazed chintz cloths are similarly produced with a resin being present during the calendaring treatment, involving passage between 2 rollers geared to run with different surface velocities so as to produce friction on the surface.

Wool cloths are not subjected to so wide a variety of finishes as are cotton and rayon cloths. The most usual form of

finishing involves a hot pressing in the presence of moisture which contributes to the setting of the wool fibres. A very important wool finish is that by which the cloth is treated with a hypochlorite (other chemicals may be used) solution to render the fibres non-felting, and the cloth is thus not likely to shrink in washing as a result of felting.

Softness of handle in all types of cloth can usually be secured by impregnating them with one of the many types of softeners now available; increased fullness of handle and even stiffness can be obtained by the use of selected filling substances. Modern softening and stiffening agents have the useful property of being strongly retained by the cloth so that the finish is permanent.

Shrink-resist finishes are produced by running the cloth through a special machine which can close up the weft threads (this shortens the cloth) to a point at which in washing the cloth shows no tendency to close up further. This mechanical finish can be combined with treatment with a resin or formaldehyde to make the closing up more permanent in the case of regenerated cellulose (viscose) fibre materials. However the cloth is finished it must (usually by a stentering treatment) be brought to a desired length and width with its warp and weft threads straight and crossing at right angles to each other. It is then ready for immediate use or for making up into various articles and garments.

See J. T. Marsh, *An Introduction to Textile Finishing*; H. Greenwood, *A Handbook of Weaving and Manufacturing*, 1948; A. J. Hall, *The Standard Handbook of Textiles* (4th ed.), 1954; *A Handbook of Textile Dyeing and Printing*, 1955; *A Handbook of Textile Finishing* (2nd ed.), 1957.

Clothes, see DRESS.

Clothilde, or **Clothilda**, St (475-545), daughter of Chilperic, King of Burgundy, and the wife of Clovis, King of the Franks. She exerted great influence over her husband, and persuaded him to become a Christian. Together they built the church of the Holy Apostles at Paris, afterwards called Ste Geneviève, in which they were both buried. At the death of Clovis C. retired to the abbey of St Martin at Tours.

Clothing, see DRESS.

Clothie, one of the Fates. See MOIRAE.

Clothworkers' Company, one of the 12 greater livery companies of the city of London. A royal charter was granted in 1528 on the amalgamation of the Fullers (1480) and Shearmen (1507). The company's first hall, built in Mincing Lane in 1480 by the Shearmen, was destroyed in the Great Fire (1666). The third hall (opened 1860) was destroyed during the Second World War, and a fourth hall is now being rebuilt on the old site. The diarist Pepys was master of the company in 1677.

Clôture, see CLOSURE.

Cloud, mass of mist consisting of minute globules of water formed of condensed aqueous vapour floating in the atmosphere. Sometimes the condensed vapour is

solidified into minute fragments of ice or snow, this being particularly the case with cirrus, cirrostratus, and cirrocumulus C.s, where the refraction of light by the ice-crystals often gives the appearance of a halo. In outline the classification of the C.s is based upon that originally put forward by Luke Howard at the beginning of the 19th cent., namely cirrus, the thread C.; cumulus, the heap C.; stratus, the flat C. or level sheet; and nimbus, the rain C. The details of a more precise classification occupied the attention of meteorologists in many countries during the latter part of the cent., among whom were specially prominent the Englishmen, the Rev. Clement Ley and the Honourable Ralph Abercromby. Other meteorologists who were specially active in this work were Prof. H. H. Hildebrandsson, of Uppsala, Sweden; M. Léon Teisserenc de Bort, of Paris; and M. A. Riggenbach, of Zürich, Switzerland. A classification was agreed at the international conference at Munich in 1891, and as a sequel the first ed. of the *International Atlas of Clouds* appeared in 1895; the last appeared in 1910, and is now out of print. After the First World War the need for a new atlas was acutely felt, and an international commission for the study of C.s was set up in 1922, under the presidency of Gen. R. Delembre, the Director of the Office National Météorologique de France, to undertake this work. An 'abridged edition for the use of observers' was produced in 1930, and the complete atlas with separate eds. having the text in French, English, and German was pub. in 1932. In this atlas a modification was introduced which was of very great importance. In the earlier atlas the C. had been considered as an entity rather than as a feature of the sky which should be considered in relation, not only to all the other C.s present, but also to the development in time. This involved some radical changes in the conception of how C.s should be viewed, and some differences in the nomenclature of C.s. This conception has led to the international codes for reporting C. types, and in the atlas an attempt was made to give in order examples not only of the basic classification but also of the sky types to which numbers are given in the reporting codes. After the Second World War, 1939-45, some amendments were made to the reporting codes at the twelfth conference of directors, held at Washington, D.C., in 1947: the most important new features are the omission of 'nimbus' and the inclusion of the new type 'nimbostratus'.

The following summary of the international classification is based on Part I of the Eng. ed. of the *International Atlas of Clouds*. A new *International Cloud Atlas* has been pub. by the World Meteorological Organisation.

TABLE OF CLOUD CLASSIFICATION

At nearly all levels C.s may appear under the following forms: (a) isolated heap C.s with vertical development during

their formation, and a spreading out when they are dissolving; (b) sheet C.s which are divided up into filaments, scales, or rounded masses, and which are often stable or in process of disintegration; (c) more or less continuous C. sheets, often in process of formation or growth.

Classification into families and genera is as follows:

Family A consists of high C.s (mean lower level 6000 metres (20,000 ft)). It should be noted that the heights given are for temperate lats. and refer, not to sea level, but to the general level of the land in the region. In certain cases there may be large departures from the given mean heights, especially as regards cirrus, which may be found at any height where ice crystals can exist.

Form b 1. Genus Cirrus.

2. Genus Cirrocumulus.

Form c 3. Genus Cirrostratus.

Family B: Middle C.s (mean upper level 6000 metres (20,000 ft), mean lower level 2000 metres (6500 ft)).

Form a } 4. Genus Altopcumulus.

Form b }

Most altocumulus and stratocumulus C.s come under category b; but the varieties cumuliformis and particularly castellatus belong to category a.

Form c 5. Genus Altostratus.

Family C: Low C.s (mean upper level 2000 metres (6500 ft), mean lower level close to the ground).

Form a } 6. Genus Stratocumulus.

Form b }

Most altocumulus and stratocumulus C.s come under category b; but the varieties cumuliformis and particularly castellatus belong to category a.

Form c { 7. Genus Stratus.

8. Genus Nimbostratus.

Family D: C.s with vertical development (mean upper level that of the cirrus, mean lower level 500 metres (1600 ft)).

Form a { 9. Genus Cumulus.

10. Genus Cumulonimbus.

DEFINITIONS AND DESCRIPTIONS OF THE FORMS OF CLOUDS.

(1) *Cirrus* (Ci.), detached clouds of delicate and fibrous appearance, without shading, generally white in colour, often of a silky appearance. Cirrus appears in the most varied forms such as isolated tufts, lines drawn across a blue sky, branching feather-like plumes, curved lines ending in tufts, etc.; they are often arranged in bands which cross the sky like meridian lines, and which, owing to the effect of perspective, converge to a point on the horizon, or to 2 opposite points (cirrostratus and cirrocumulus often take part in the formation of these bands).

(2) *Cirrocumulus* (Cc.), cirriform layer or patch composed of small white flakes or of very small globular masses, without shadows, which are arranged in groups of

lines, or more often in ripples resembling those of the sands on the sea shore. In general cirrocumulus represents a degraded state of cirrus and cirrostratus, both of which may change into it. In this case the changing patches often retain some fibrous structure in places.

Real cirrocumulus is uncommon. It must not be confused with small altocumulus on the edges of altocumulus sheets.

(3) *Cirrostratus* (Cs.), thin whitish veil, which does not blur the outlines of the sun or moon, but gives rise to halos. Sometimes it is quite diffuse and merely gives the sky a milky look; sometimes it more or less distinctly shows a fibrous structure with disordered filaments.

(4) *Altopcumulus* (Ac.), layer (or patches) composed of laminae or rather flattened globular masses, the smallest elements of the regularly arranged layer being fairly small and thin, with or without shading. These elements are arranged in groups, in lines or waves, following 1 or 2 directions, and are sometimes so close together that their edges join. The thin and translucent edges of the elements often show *irisations* which are rather characteristic of this class of C.

(5) *Altostratus* (As.), striated or fibrous veil, more or less grey or bluish in colour. This C. is like thick cirrostratus, but without halo phenomena; the sun or moon shows vaguely, with a faint gleam, as though through ground glass. Sometimes the sheet is thin with forms intermediate with cirrostratus (altostratus translucentus). Sometimes it is very thick and dark (altostratus opacus), sometimes even completely hiding the sun or moon. In this case differences of thickness may cause relatively light patches between very dark parts; but the surface never shows real relief, and the striated or fibrous structure is always seen in places in the body of the C.

(6) *Stratocumulus* (Sc.), layer (or patches) composed of globular masses or rolls; the smallest of the regularly arranged elements are fairly large; they are soft and grey, with darker parts. These elements are arranged in groups, in lines, or in waves, aligned in 1 or in 2 directions. Very often the rolls are so close that their edges join together; when they cover the whole sky—on the Continent, especially in winter—they have a wavy appearance.

(7) *Stratus* (St.), uniform layer of C., resembling fog, but not resting on the ground. When this very low layer is broken up into irregular shreds it is designated *fractostratus* (Fs.).

(8) *Nimbostratus* (Ns.), low, amorphous, and rainy layer, of a dark grey colour and nearly uniform. It appears as though feebly illuminated seemingly from inside. When it gives precipitation this is in the form of continuous rain or snow. But precipitation alone is not sufficient criterion to distinguish the C., which should be called nimbostratus even when no rain or snow falls from it. There is often precipitation which does not reach the ground; in this case the base of the

C. is always diffuse and looks 'wet' on account of the general trailing precipitation, *virga*, so that it is not possible to determine the limit of its lower surface.

(9) *Cumulus* (Cu.), thick C.s with vertical development; the upper surface is dome shaped and exhibits rounded protuberances, while the base is nearly horizontal. When the C. is opposite the sun the surfaces normal to the observer are brighter than the edges of the protuberances. When the light comes from the side the C.s exhibit strong contrasts of light and shade; against the sun, on the other hand, they look dark with a bright edge. True cumulus is definitely limited above and below; its surface often appears hard and clear cut. But one may also observe a C. resembling ragged cumulus in which the different parts show constant change. This C. is designated *fractocumulus* (Fc.).

(10) *Cumulonimbus* (Cb.), heavy masses of C., with great vertical development, whose cumuliform summits rise in the form of mts or towers, the upper parts having a fibrous texture and often spreading out in the shape of an anvil. The base resembles nimbostratus, and one generally notices *virga*. This base has often a layer of very low ragged C.s below it (*fractostratus*, *fractocumulus*). *Cumulonimbus* C.s generally produce showers of rain or snow and sometimes of hail or soft hail, and often thunderstorms as well. If the whole of the C. cannot be seen the fall of a real shower is enough to characterise the C. as a *cumulonimbus*.

PRINCIPAL VARIETIES OF CLOUDS

In addition to *families* and *genera* which suffice for the broad classification of C. forms, the new International Atlas also recognises *sub-genera*, *species*, *varieties*, and *casual details* to which distinguishing Lat. adjectives are applied for purposes of more precise differentiation. For details of these sub-classifications reference should be made to the atlas. Among the most important of these sub-classifications are those distinguished by the adjectives '*cumuliformis*,' '*lenticularis*,' '*castellatus*,' and '*mammatus*.'

See Air Ministry (Meteorological Office) M.O. 233, *Cloud Forms*, 1949, from which the above text is reprinted, by permission of the Controller of Her Majesty's Stationery Office; also G. A. Clarke, *Clouds*, 1920; A. W. Clayton, *Cloud Studies*, 1925; C. J. P. Cavo, *Clouds and Weather Phenomena*, 1926, 1943.

Cloudberry, see RUBUS.

Cloued Leopard, see LEOPARD.

Clouet, François (c. 1510-72), Fr. painter, son of Jean C. the Younger (c. 1485-1545). Father and son were noted miniaturists. He succeeded his father in the twofold office of *valet de chambre* and painter-in-ordinary to Francis I in 1545 and held the post under Henry II and Charles IX. He executed portraits of Henry II, Mary Queen of Scots, and Catherine de' Medici (now in Castle Howard, Yorks). There is a portrait of Francis II as an infant in the Antwerp

Museum, and sev. of his paintings are in the Louvre, Vienna, Florence, and other European cities and there is a fine series of his drawings in the National Library, Paris, some crayon heads in the Brit. Museum, and examples of his portraiture in Hampton Court and Hertford House, London.

Clough, Anne Jemima (1820-92), b. Liverpool, pioneer in the higher education of women. In 1871 she became head of the first house for women students in Cambridge. This house developed into Newnham Hall and, in 1880, into Newnham College (q.v.), of which she was first principal.

Clough, Arthur Hugh (1819-61), poet, b. Liverpool. In 1822 his father, a cotton merchant, emigrated to Charleston, S. Carolina, with his family. In 1828 C. returned to England to school at Chester; from there he passed to Rugby, then under Dr Arnold, and to Balliol College, Oxford. In 1842 he was elected to a fellowship at Oriel College, Oxford at this time was in the throes of fierce theological controversy, and C. fell for a time under the influence of Newman's High Church principles; this was followed by a period of scepticism, and in 1848 he felt called upon to resign his post. Then he travelled for a time, and was in Paris during the revolutionary movements of 1849, and at Rome during its siege by the French. From 1849 to 1852 he was principal of Univ. Hall, London. In 1854 he married, and in 1856 was appointed secretary to the commission for examining scientific military schools on the Continent. In 1848 he pub. *The Bothie of Tober-na-Vuolich*, a 'long-vacation pastoral' in hexameters; in 1849 a collection of poems, called *Ambarvalia*, with his friend, Thomas Burbidge. In the same year he wrote *Amours de Voyage*, a novel, also in hexameters, at Rome; *Dipsychus*, a satire, followed in 1850; and *Mari Magno, or Tales on Board*, a series of idylls, in 1861. *Plutarch's Lives*, 1859, was a revision of Dryden's and other 17th-cent. translators' ed. of Plutarch. His work contains much deep thought and clever experiment with hexameters, but, except in the case of a few of his lyrics, never rises to great worth or beauty. C. is the subject of Matthew Arnold's beautiful elegy, *Thyrsis*. His collected *Poems* were ed., with a memoir by F. T. Palgrave, 1862. See monographs by S. Waddington, 1882, J. I. Osborne, 1920, and G. Levy, 1938.

Clouston, Joseph Storer (1870-1914), novelist, b. Cumberland, came of an old Orkney family. Educ. at Merchiston Castle and Oxford, he was called to the bar but never practised law. In 1899 he pub. his first novel, *The Lunatic at Large*, which was so successful that he later added a number of sequels. He wrote sev. other novels, including 2 war thrillers, and also a *History of Orkney*, 1932.

Clovelly, fishing vil. of N. Devon, England, 11 m. WSW. of Bideford in the Barnstaple parl. div. It is situated in a sheltered valley; the main street, being of cobbles with steps here and there,

descends 400 ft to a rude little pier. Transportation is by slides or sledge downwards, and by donkeys upwards. There is an ancient Brit. encampment a mile away. Pop. 533.

Clover, name given to various species of *Trifolium*, the leguminous genus to which belong the shamrock and trefoil. C. was introduced into the agriculture of Great Britain about the 16th cent. from the Low Countries, where it had long been cultivated as green food for cattle in situations where natural pastures were scarce. The species are ann., biennial, or perennial plants, and of these the biennial produces the richest crop. Red C. is the most approved variety, and is usually sown with barley or oats, sometimes among wheat or rye in spring. The first crop is generally mown and made into hay, which must be perfectly dry before it is stacked, and in winter it provides a very nutritious food for cattle. White C. is a perennial which grows rapidly and forms excellent pasture, especially for sheep; a light calcareous soil is best adapted for its growth. It is also valuable to man as a source of honey. Another perennial C. is the cow-grass, which is found in all rich meadows, and is often sown in conjunction with white C. *T. minus*, the lesser yellow trefoil, and *T. procumbens*, the hop trefoil, are also valuable varieties found in good pastures. The only ann. C. which is cultivated is *T. incarnatum*, a species which has been brought from the E. The It. rye-grass, *Lolium perenne italicum*, is often sown with it and will grow as rapidly; it is a good corrector of the heating qualities of C. hay. The prin. use of this C. is to raise very early food for ewes and lambs.

Clowes (M.E. *clow* (e) from Fr. *clou*, a nail), dried, unexpanding flower-buds of the clove-tree (*Eugenia caryophyllata*), a plant belonging to the family Myrtaceae, a native of the Molucca Is. The tree is an evergreen, growing to about 40 ft in height, with large oval leaves and small flowers, produced in great numbers in cymes, which become red when ready for picking. The entire plant has an aromatic odour. The buds, when gathered, are a little over half an inch long, and consist of a cylindrical calyx, at the end of which are 4 extended sepals and a ball formed by 4 unopened petals. They are dried either in the sun or by wood smoke, and then become of a reddish-brown colour. They have a very powerful odour and a hot and acrid taste, and on pressure exude a volatile oil, of which they contain a large proportion, about one-fifth of their entire weight. C. are mainly used for flavouring in cookery and confectionery, and also to preserve clothing from moths. The essential oil is extracted by means of repeated distillation with water, and when carefully prepared is of a pale yellow colour, later turning to brown, and with the taste and odour of C. It is known to the pharmacopoeia as *Oleum caryophylli*, and is a mixture of eugenol ($C_{10}H_{12}O_2$) and a hydrocarbon ($C_{15}H_{24}$). The oil is soluble

in alcohol, ether, and fixed oils. It is used in medicine as a flavouring agent and to prevent nausea and griping caused by purgatives. Its volatile qualities make it valuable to relieve toothache, and it is also used as a local anaesthetic. C. are now chiefly cultivated in Amboyna, Zanzibar, Pemba, Java, Sumatra, Réunion, and the W. Indies. The Dutch long held the monopoly of clove-growing in the Moluccas.

Clovio, Chlodowech, or Chlodwig, name of 2 Merovingian kings of the Franks:

Clovio I (c. 465-511) succeeded his father Childeric in the year 481 as king of the Salian Franks. In 486 he overthrew the Gallo-Romans under Syagrius, near Soissons; in 493 married Clothilde (q.v.), a Christian Burgundian princess, and in 496 embraced her faith. In 507 he defeated and killed Alaric II, the Arian king of the Visigoths, at Vouille, but was checked at Arles by Theodoric, King of the Ostrogoths. He then settled in Paris, where he d. He was the real founder of the united Frankish kingdom.

Clovio II (633-56) succeeded his father, Dagobert I, in 638 as King of Neustria and Burgundy. In 656 he instigated the assassination of the usurping King of Austrasia, annexed his dominions, and thus became king of the whole Frankish empire.

Clovio, cap. of Curry co., E. New Mexico, U.S.A., on Llano Estacado, near Texas line. It is a railroad div. point and an important trade and live-stock centre. It has repair shops and manufs. flour, dairy products, and beverages. Artefacts of the Folsom period have been found near by. E. New Mexico State Park is 11 m. S. Pop. 17,318.

Clowes, William (1544-1604), surgeon, b. Kingsbury, Warwickshire. He was surgeon at St Bartholomew's Hospital, served in the Netherlands with Leicester, and took part in the defeat of the Sp. Armada, later becoming surgeon to Elizabeth I. He was the greatest of the Elizabethan surgeons. He wrote *A Prooved Practise for all Young Chirurgeons*, 1588, and books on syphilis and scrofula. A vol. of his *Selected Works* was pub. in 1949.

Clowes, William (1780-1851), joint founder with Hugh Bourne of Primitive Methodism, was a native of Burslem, who came to live at Tunstall. Here he worked as a potter and gained a reputation as an excellent dancer. Attracted by the open-air meetings of Bourne, which differed from Wesley's 'camp meetings' in having both prayers and singing, he early joined a Methodist class, visited the country cottages as an evangelist, and held prayer meetings and love-feasts in his home. C. supported Bourne in his efforts to hold religious meetings, which should persuade men to renounce their wakes and the drunkenness and other vicious habits there practised. The new brotherhood, which had at first availed itself of Wesleyan Methodist protection, definitely repudiated all connection with Wesleyans in 1810. Even C., who had leanings towards the older sect, was cut off from his church in 1808 and 1810 for

officiating at camp meetings in Ramsor. In 1811 he became the preacher at a chapel in Tunstall of a small society of Primitive Methodists who had first met together in a kitchen. After 1827 C. gave up circuit work, but continued his mission of evangelisation till his death. He was a man of fine presence and engaging disposition, and his strong personality, with which was combined a fine and enthusiastic delivery, secured many converts to his cause. The influence of the movement to which C. gave his life is well reflected in the works of George Eliot, George Borrow, and Arnold Bennett.

Clowes, Sir William Laird (1856-1905), naval writer and historian. His series of articles, under the pseudonym 'Nauticus,' in the *Daily Graphic* (1893), entitled 'The Needs of the Navy,' had an enormous influence on public and official opinion. In 1891 he had been largely instrumental in the foundation of the Navy Records Society, and between 1897 and 1903 he compiled *The Royal Navy: its History from the Earliest Times*, in collaboration with Sir Clements Markham and others. Among his other works are *Black America: a Study of the Ex-Slave and his Late Master*, 1891, *The Great Peril*, 1893, *The Naval Campaign of Lissa*, 1901, *The Mercantile Marine in War Time*, 1902, and *Four Modern Naval Campaigns*, 1902.

Clown, buffoon, formerly attached to the households of nobles, now a comic character in a pantomime. See JESTER.

Cloyne, mkt tn of co. Cork, Rep. of Ireland, 15 m. ESE. of Cork. It gives its name to a Rom. Catholic diocese, the cathedral of which is at Cogh, but it also has a Protestant cathedral (founded by St Colman in the 6th cent.), opposite which is a splendid and well-preserved round tower rising to a height of 90 ft. Pop. 620.

Club, an association of people with common interests, objects, tastes, or pursuits. Social C.s demand good fellowship, conversation, and an accepted standard of behaviour. Periodic meetings are held for conviviality, for co-operation, or merely to enable the members to eat and drink together. By pooling subscriptions and sharing amenities the members may enjoy the occupation of valuable land and fine buildings while each member retains his independence. To prevent overcrowding the number of members is usually limited and each member may oppose the entry of any newcomer. Elections are by ballot or by a selection committee. Every C. has an ann. meeting and periodic changes in its committees. The ownership of many C.s is proprietary and the liability of members is limited. Early records of civilisation show that people gathered together for communal life. Apart from Gk and Rom. accounts, there are ancient buildings in Africa, Asia, and Europe which were used as meeting-places. Secret societies were concerned with religion and politics, and guilds handled commerce. In their most indefinite form the foundation of Eng. C.s began in the

15th cent. Taverns and coffee-houses were used. Towards the end of the 16th cent. Raleigh and Shakespeare used the Mermaid Tavern at Bread St. and Ben Jonson the Devil Tavern; later Steele and Addison frequented Button's Coffee-house. The cult of coffee-drinking led to the use of coffee-houses (q.v.) for free speech and for the spreading of news; Charles II failed in his attempt to suppress such meetings. Some of the most popular coffee-houses were Garraway's, Child's in St Paul's Churchyard, the Grecian beside the Temple, Will's in Covent Garden, and Lloyd's in Tower St (before it moved to Abchurch Lane). In the days of Pepys each of these places had their own patrons and it was not until the 17th cent. that exclusive C.s were first set up. Strangers could intrude into select gatherings, and a desire to prevent this led to the formation of what is to-day the accepted type of Brit. C. Men sought and came to value the privilege of exclusive company. A political C., the Rota, was founded in 1659, and the Kit-Kat in 1700. Two years earlier Mrs White was running her Chocolate House in St James's St, and she proved so successful that her name survives to-day as that of the famous London C., White's. So great was the demand for membership of her C. that another known as the

'Young Whites' was formed among prospective members awaiting election. The Dilettante C. was started in 1734 and subsequently its dinners were perpetuated at the St James's C. The Royal Society in 1743 provided the first dining-room for learned men. The passage of time saw the disappearance of many famous C.s, but one world-renowned London C. remains to-day, the Athenaeum. At the house of John Murray in Albemarle St a notable gathering took place in 1823. It was there that John Wilson Croker persuaded a score of learned men to adopt his plan for a meeting-place for gentlemen of scientific or literary attainment. Scott and Moore were members of the original committee. The C. takes its name from a building in Athens dedicated to Minerva where philosophers recited their works, and above the entry there is a statue of Athene. The imposing C. building was designed by Decimus Burton. In prov. tns also, including Bristol and Manchester, the name Athenaeum is perpetuated.

In the West End of London to-day there are some 3 dozen purely social C.s, apart from a further 2 dozen with a more specialised membership. Long ago the members of the most exclusive C.s were more demonstrative than they are to-day. They indulged in singing, speech-making, drinking, eating, and gambling on the grand scale. Stakes ran high at places such as Almaack's and Crockford's, and a glass of port or mulled sack cost but a few coppers. Univ. C.s were estab. early in the 19th cent. and political C.s included the Carlton, the Junior Carlton, the Conservative, the Reform, the Devonshire, Brooks's, and the National Liberal. Specialist C.s were the United Service

(now E. India and Sports), the Oriental, the Garrick, the Savage, the Arts, the Bath, and Boodles'. There are many other C.s of note in the tiny area forming London's clubland, while outside London there are more than 150 first-class C.s in England alone. Scotland has more than 2 dozen and there are half a dozen in N. Ireland. Within Great Britain there are about 4 dozen C.s devoted to yachting, to mention only one form of sport. Early in the 20th cent., due to increasing urbanisation, London lost its country C.s, which had included the Royal Botanic Society (at Regent's Park), Roehampton, Ranelagh, and the open polo ground at Hurlingham. Three unique C.s worthy of mention are the Jockey C., 1750, the

C., New York, from 1836; other New York C.s are the Century, the Manhattan, the Knickerbocker, and the University. The Puritan C. is in Boston. In addition there are C.s concerned with every kind of sport and others interested in welfare and in commerce. There are more than 1800 golf C.s.

In Canada there are more than 150 prin. C.s. The number in each prov. varies considerably; Ontario has more than 60, Quebec 40, and Brit. Columbia 20, with fewer in Alberta, Manitoba, New Brunswick, Saskatchewan, and Nova Scotia. The number of members in individual C.s of note varies from around 200 to well over 2000 persons. Some C.s date back more than 100 years; in the



Cadbury Brothers Ltd

WHITE'S CHOCOLATE HOUSE, ST JAMES'S, IN 1708

A modern painting by H. W. White.

Royal Blackheath Golf C. (18th cent.), and the Marylebone Cricket C., whose members long ago leased their grounds from a Mr Lord. The last attracted players from the Hambledon C., where the members wore a uniform, a fashion which once had its counterpart in the Royal Burgess C., Edinburgh. In Princes St, Edinburgh, stands the New C., which dates from 1787. For generations Brit. C.s barred lady members, but the position of ladies has changed considerably within recent years; many C.s have rooms set aside where ladies are entertained. There are other C.s with a mixed membership of men and women, but these are not numerous. The first C. formed for women was the Alexandria in 1883.

In the U.S.A. country C.s are the great social gathering places, and there are no comparable country C.s in Great Britain. There are very early mentions of such C.s as the Old South, the Temple, the San Souci (1780), and the League (1863). In most cities there are fine C.s. Among the prin. social C.s, the Brookline Country C., Brookline, Massachusetts, is probably the oldest. The Bohemian, San Francisco, California, dates from 1887; the Lotus C., New York, from 1870; the Lamb's, New York, from 1874; the Union

main the Canadian C.s exist as country C.s, golf or yacht C.s. All these cater for both sexes. In addition there are a few social C.s of high standing where the C. maintains fine buildings, meals are served, and in some cases there are bedrooms for members. Prin. Canadian C.s include the Montreal Amateur Athletic C., which has 5000 members and is residential; the Granite C., Toronto, has a still larger membership, and also dining facilities; at Calgary too there is another fine C., the Glencoe, and these are social C.s in the fullest sense. C.s may also be estab. for purposes of sport or welfare or as youth organisations or for combat service, or based on projects such as those of Rotary.

New Zealand has numerous C.s for yachting, seaboard activities, and golf, but apart from these special interests, social C.s are found in the larger cities. In Auckland there are 3, and in Christchurch, Dunedin, and Wellington 2 each. All these C.s serve meals, and some provide bedrooms for members; one New Zealand C. is run in many respects on the lines of London's Savage C. In Australia the Sydney Savage C. was founded in 1934 and based its rules and constitution on those of the older C. of that name in

London; it is for men only. In Australian C.s gatherings are held called *Corroborees*. Also in Sydney is the Arts C.; another social C. of standing. An exclusive C. is the Pioneer, also in Sydney, and at Melbourne there is a first-rate social C., the Melbourne C. Somewhat different is Sydney's Legacy C., whose members are returned ex-service men; it aims to help survivors of fallen comrades. It is a mixed C. where parents attend with their children, and has a number of prov. branches. A. C. specially formed for women is the Queen's C. in Sydney. Apart from the few purely social C.s which are conducted on rather more progressive lines than the oldest London C.s, there are countless C.s with sporting, welfare, and trade interests, but without C. premises; meetings are held at places where meals are served.

C.s were formed in France as a direct result of the revolution. The C. Breton, 1782, was subsequently renamed C. des Jacobins and, linking up with the C. des Cordeliers, it caused the formation of a political party. In early days Fr. C.s confined their activities to public affairs, and in 1799, during the Directory, they were suppressed. Although C.s were re-established after the revolutionary period, in 1848 they were once more suppressed. To-day the position is very different. There are various Fr. Academies, where membership is small and limited to persons notable in their respective fields, but these are not C.s in the wider sense. There are also Fr. C.s for a variety of purposes, for welfare and for sport, run in the same way as in the Brit. Is. In the big cities of France there are more than 4 dozen first-rate C.s, foremost among these being the Nouveau Cercle, Paris. It is linked to other C.s outside France and is in every sense a quality C. On payment of a far more modest fee, at 2 other C.s visitors are admitted to membership; there are also the Cercle de l'Union, and the Cercle Central des Lettres et des Arts. The leading military C. is the renowned Cercle Militaire. There are no women's C.s comparable with those to be found in London's West End, but for ladies there are countless C.s concerned with educational work and with every form of religion; besides these there are sev. with a general appeal to women. The 5 prin. ones are Conseil National des Femmes Français, the Union Nationale des Femmes, the Fédération Nationale des Femmes, the Union Feminine Civique et Sociale, and the Union Française des Femmes.

Club-foot (*Talipes*), deformity of the foot depending on contraction of certain muscles or tendons. It may be congenital or acquired. If congenital the cause may be long-sustained pressure upon the foot in the womb. Many mild cases of the congenital defect submit to early treatment. When the deformity is acquired it is almost invariably the result of infantile paralysis; certain muscles retain their function, and their prolonged contraction is followed by shortening of the ligaments connecting the bones.

The varieties of C. are (1) *T. equinus*, where the subject walks upon the fore part of the foot, the heel not touching the ground; (2) *T. varus*, where the outer edge of the sole touches the ground, the foot being turned inwards; (3) *T. calcaneus*, where the heel only touches the ground, the toes being pointed upwards; and (4) *T. valgus*, where the subject walks upon the inner edge of the sole. The former two are the congenital types, and are often combined, when the deformity is known as *T. equino-varus*. The latter two are nearly always acquired. Treatment of C. should, above all, be prompt. If it is congenital efforts should be made by constant manipulation to encourage the foot to take up a normal position. If this is unsuccessful it may be necessary to separate the contracted tendons by surgical operation. The foot is then kept immovable in the normal position by being set in plaster of Paris until the tendons and ligaments have grown to the required extent. Generally it is also necessary to apply a splint which keeps the foot in the correct position, so that, as growth goes on, the bones are moulded to the proper shape in a few months.

Club-hand, deformity of the hand similar to that of club-foot. The hand is permanently bent at the wrist, by contraction of the flexor muscles, or is bent backwards, as by contraction of the extensors. It is often associated with other deformities. The fingers of the affected hand are weak or useless. Treatment, where possible, is surgical.

Club-root, see CLUBBING.

Club-shell, see CLAVAGELLUM.

Club Mosses, see LYCOPODIUM.

Clubbing, or Club-root, disease which often attacks the roots of turnips, cabbages, and other cruciferous plants, usually the result of improper cultivation. It is due to the ravages of a slime fungus, *Plasmidiophora brassicae*. It causes the host plant to send out nodular outgrowths from the root with subsequent gradual decay of the plant itself. Lime is the best disinfectant against C., because the spores of the fungus cannot germinate in it or penetrate it. Any cruciferous plant can spread the disease, so it is not safe to grow them in soil that has once been infected, unless it is previously thoroughly dressed with lime. The spores will lie dormant for sev. years if no suitable host presents itself, but germinates actively as soon as any crucifer is present.

Clugia, see CHIOGGIA.

Cluj (Hungarian Kolozsvár; Ger. Klausenburg), tn and episcopal see of Transylvania, Rumania, 210 m. N.W. of Bucharest, and cap. of the prov. of C. Formerly the cap. of Transylvania, the tn is well built and has a Gothic church, a museum, and a citadel. There were 4 bishoprics—Rumanian Orthodox, Uniate, Reformed Church, and Unitarian; the tn is the literary centre of Transylvania and has many educational estab., including a univ. Before the Second World War there were manufs. of linen and woollen goods, earthenware, beer, sugar, paper, and soap.

Formerly Hungarian, it passed to Rumania after the First World War. By the end of Aug. 1944 Soviet forces were consolidating their grip on the passes leading into Transylvania, and C. would have been stormed had not the Rumanian Gov. surrendered. Pop. (1948) 118,000.

Clumber Spaniel, see SPANIEL.

Clunes, tn of Talbot co., Victoria, Australia, 97 m. NW. of Melbourne by rail. It is in the gold-mining dist. opened up in 1851, and is also the centre of an agric. and pastoral industry. Pop. 1225.

Cluny, Fr. tn on the Grosne, 14½ m. NW. of Mâcon by rail, in the dept of Saône-et-Loire. A vil. in 910, the year of the abbey's foundation, it owed its later importance entirely to the monastery. The fame of the order of Cluniac Benedictines is due to the greatness of its abbots, who from 910 to 1157 were, with one exception, conspicuous alike for their piety and strength of will. Odo, the second abbot, made C. the centre of a great monastic revival. The result of his work and that of his successors was that, by 1150, 314 monasteries in all parts of Europe had embraced the Cluniac regime, and were completely subject to C. The order declined rapidly after the death of Peter the Venerable in 1157, so that in 1528 the monastery fell into 'commendam' (q.v.); in 1790, after a regrettable schism between the Reformed and Unreformed, the order was finally abolished. As commendatory abbots both Richelieu and Mazarin had initiated projects of reform. A great normal school was estab. here in 1865. Pop. 4100.

Clupeidae, family of soft-rayed fishes, contains many well-known species, such as the anchovy, herring, pilchard, and sprat. They have scaly bodies and a naked head, and the species inhabit temperate and tropical seas near the coast.

Cluseret, **Gustave Paul** (1823-1900), Fr. soldier and politician, b. Paris, and educ. at Saint-Cyr. He served in the Crimean War, as a *garde mobile* in the revolution of 1848, in sev. expeditions under Garibaldi in 1860, and 1861-4 on the side of the Unionists in America. On his return to France he became a member of the Internationale, and in 1871 he was for a short time at the head of the military operations of the Paris Commune, and narrowly escaped arrest by fleeing to London; in his absence he was condemned to death by the Third Council of War, 1872. In 1884 under an amnesty he returned to France, and in 1888-9 sat in the Chamber as deputy for Toulon.

Clusia, Amer. genus of Guttiferae, consists of climbing trees and shrubs, often epiphytes, which yield a viscid resinous juice of a balsamic flavour; hence they are in England called balsam-trees. *C. alba* has a scarlet fruit with seeds embedded in scarlet pulp. The plant abounds in balsamic juice of a green colour, which becomes brown when exposed to the air; the seeds are a favourite food of birds, and are plucked from the fruit while hanging on the tree. *C. quapoya* is a climbing shrub with

yellow flowers, and yields a white, transparent juice.

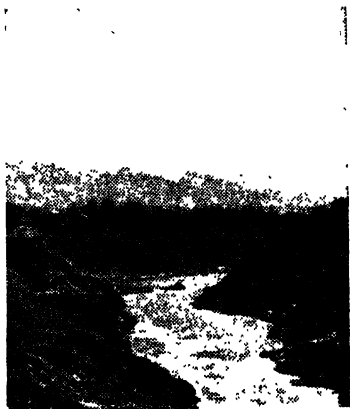
Clusium, see CHIUSI.

Clusone, It. tn in Lombardy (q.v.), 19 m. NE. of Bergamo (q.v.). It has copper and iron works, and a trade in corn. Pop. 6000.

Cluster, see STAR, *Star Clusters*.

Cluster Cup, see AECIDIUM.

Clutch, device by which one shaft may be coupled to another, or released. It consists of a fixed and a movable part and when these parts are in contact the 2 shafts revolve together, and when the C. is disengaged or its 1 part moved away from the other, the shafts are independent of one another. The friction C. is commoner than the dog C., which operates rather in the manner of a zip fastener. But the materials used, the method of pressing the 2 surfaces together, and the details of construction vary widely according to the conditions in which the C. is used. Cast iron in contact with cast iron, steel on bronze, and steel or cast iron on a fabric lining are commonly used. The fabric lining consists mostly of asbestos and brass wire. In the magnetic C. the operating force, provided by a spring in other C.s of the axial type, is produced by the magnetic attraction of one plate towards the other, acting as an electro-magnet.



New Zealand Gov.
THE CLUTHA RIVER, SOUTH ISLAND,
NEW ZEALAND

Clutha, or **Molyneux**, riv. in the S. Is. of New Zealand. It rises in Lake Wanaka and, traversing the prov. of Otago, falls into the sea at Molyneux.

Cluthalite, mineral obtaining its name from the Clyde valley, where it was found. It is a red, flesh-coloured variety of analcime (a zeolite mineral which occurs as pellucid crystals in basalt). It occurs in vitreous crystals, and is a hydrous silicate of the zeolite section.

Cluwer, or **Cluwerius**, **Philip** (1580-

1623), Ger. geographer and historian, and a great traveller. He served as a soldier in Bohemia and Hungary, and was for a time in prison. After tours in France and the Brit. Isles he returned to Leyden, where the academy allowed him a regular pension. His chief works were *Germania Antiqua*, 1616, a treatise on anc't Sicily, Sardinia, and Corsica, 1619, and his *Introductio in Universam Geographiam*, pub. posthumously in 1629.

Clwyd, riv. which rises in S. Denbighshire, Wales, and flows past St Asaph and Rhuddlan to the Irish Sea at Rhyl. The Elwy is the chief trib. Its valley is noted for its fine scenery.

Clyde, Baron, see CAMPBELL, SIR COLIN. **Clyde**, chief riv. of Lanarkshire, Scotland, and one of the world's greatest commercial waterways. Its estuary forms the Firth of Clyde, the finest on the W. coast.

Daer Water, which rises in the Lowthers at Gann Hill (2190 ft.) and Pot-rail Water, which unite near Elvanfoot, are the chief head-streams of the C. It rounds Tinto Hill, and its course is fairly devious till a point 4 m. above Lanark is reached, after which it is, broadly speaking, N.-westerly as far as Dumbarton, where it discharges itself into the Firth. On the l. b. the prin. tribs. are the Duneaton (19 m. long), entering above Robertson; the Douglas (20 m.), above Bonnington; the Avon (28 m.), at Hamilton; and the White Cart (19 m.), below Renfrew; the affluents on the right are the Medwin (16 m.), joining the main stream near Carnwath; the Mouse, at Lanark; the S. Calder (16 m.), above Bothwell; the N. Calder (12 m.); and the Kelvin (21 m.), at Glasgow. Near Lanark the C. rapidly falls 230 ft. within 3½ m., forming the 4 famous falls of C., namely, the Bonnington Linn, which is the most graceful; the Corra Linn, which in 3 leaps makes a magnificent cascade 84 ft. in height; and the Dundaff and the Stonebyres Linn, the latter of which resembles the Corra. In flood-time the Corra Linn makes a single descent of 80 ft. or more. Stretching some 106 m. from its source in the Daer to Dumbarton, the C. is the third longest riv. in the country, the other 2 being the Spey and the Tay. Altogether it drains an area of 1481 sq. m. Above the falls it is a pure trout stream, watering pastoral uplands. Below it traverses a fertile valley, sometimes pent up between wooded slopes, sometimes broadening out into a plain. But long before the riv. reaches Glasgow, where the pollution is completed, it grows every mile more sluggish and begrimed as it receives the contamination of various trade effluents. Even in the 18th cent. the C. was fordable in the heart of Glasgow. But neither effort nor money has been spared in deepening the channel, which is now 19 ft. at Glasgow even at low tide. Thus the docks at Glasgow can hold the largest vessels, and since Henry Bell launched the first commercially successful steamer, the *Comet*, on the C. in 1812, the ship-building and shipping traffic has increased by leaps and bounds. A weir prevents the further ascent of the tide above

Glasgow. The chief tns on its banks from Elvanfoot to Glasgow are Crawford, Lanark, Hamilton, Bothwell, and Blantyre. The junction for the Forth and C. Canal is at Bowling. The ports are Glasgow, Port Glasgow, Greenock, Ardrossan, Troon, Ayr, and Campbelltown. The fairway of the Firth, which reaches from Dumbarton to Ailsa Craig, measures over 60 m., and from the Mull of Kintyre to Girvan is nearly 40 m. across. The chief is. in the Firth are Arran, Bute, and the Cumbraes, and among the sea lochs, many of which are popular holiday and health resorts, are Gareloch, Loch Long, Holy Loch, and Loch Fyne. These are all on the highland coast.

'Clyde,' The, see GALLIPOLI CAMPAIGN. **Clydebank**, burgh of Dumbartonshire, Scotland, on the r. b. of the Clyde, 6 m. NW. of Glasgow. Since 1886 Kilbowie and Dalmuir have been included in the burgh. At C. there are a shipbuilding yard and engineering works, at Kilbowie the factories of the Singer Manufacturing Co., and at Dalmuir a shipbuilding yard, a new t'n hall, and public library. Pop. 46,400.

Clydesdale, valley of the Clyde (q.v.), in Lanarkshire, Scotland. Iron and coal are mined in it, and there are many orchards. It gives its name to a well-known breed of heavy horses.

Clydesdale Breed, see HORSE. **Clydesdale Terrier**, or **Paisley Terrier**, resembles the prick-eared variety of Skye terrier. It was only introduced about 50 years ago, and is kept entirely as a house-dog. It has a long, silky coat, and is light-coloured with tan legs. Weight 15 to 20 lb.

Clynes, John Robert (1860-1949), Labour politician, b. Oldham. C. attended St Anne's elementary school when a half-timer in a cotton-mill; but he began self-education as a piecer aged 17. He took part in the estab. of a (short-lived) Pipers' Union, which helped to make a speaker of him. He was enlisted by Will Thorne, M.P., as an unpaid speaker at his organising meetings of the Gas and General Workers throughout Lancs. At 22 he was appointed organiser at 30s. a week; he held the post for 6 years, and then became secretary of the Lancs dist. of the union. In 1906 he won, at his first attempt, a parl. seat, becoming Labour member for NE. Manchester—a constituency he represented till its disappearance in 1918; after that he sat for the Platting div. He was parl. secretary to the Ministry of Food, 1917-18; became food controller (and privy councillor) in the latter year, but resigned when his party withdrew from the Coalition. Vice-chairman of the Labour party, 1919; chairman, 1921—but in 1922 was relegated to deputy-chairmanship. In the Labour Gov. of 1924 he was lord privy seal and deputy-leader of the Commons. When the party took office again in 1929, he became home secretary. He was defeated in the general election, 1931, but re-elected in 1935. He did not contest the general election of 1945. C. pub. his memoirs in 1937.

Clypeus Sobieski (Lat. *clypeus*, a shield), constellation formed by Hevelius (1611-1687) out of some small stars S. of Aquila. It was named in honour of John Sobieski III, King of Poland (1674-96). It has a large number of splendid telescopic fields.

Clytaemnestra, daughter of Leda, wife of Tyndareus, King of Sparta, by Zeus, and sister of Castor (q.v.), married Agamemnon, King of Argos. During his absence at Troy, C. lived with his cousin, Aegisthus, and to save herself, on his return murdered him in his bath (according to some accounts to avenge the sacrifice of her daughter, Iphigenia). C. then married Aegisthus, who usurped the throne of Argos. Orestes, her son, with the aid of his sister Electra, killed the guilty pair. See AEGISTHUS; AGAMEMNON; ELECTRA; IPHIGENIA; ORESTES.

Clytie, sea-nymph, daughter of Oceanus, pined for love of Apollo, who deserted her for Leucothoe, and was turned into a sunflower or heliotropium.

Cnidoblasts, see THREAD CELLS.

Cnidus, anct Gk city on the coast of Caria, Asia Minor, at the end of the peninsula of Triopium (Cape Krio); colonised from the Peloponnesus. One of the 6 cities of the Dorian League, C. was the bp. of the astronomer Eudoxus (q.v.). Originally on an is., the settlement spread to the mainland. The city was famed for its worship of Aphrodite, her celebrated statue (by Praxiteles) being in one of its temples. In 394 bc the Athenian admiral Conon, commanding a Persian fleet, defeated the Spartan fleet under Pisander near C. The fine seated statue of Demeter (Brit. Museum) was excavated from the ruins of C. See C. T. Newton and R. P. Pullen, *Discoveries at Halicarnassus, Cnidus, and Branchidae*, 1862-3, and *Travels and Discoveries in the Levant*, 1865.

Cnossus, see KNOSSOS.

Cnut, see CANUTE.

Coach and Coaching (Magyar *kocsi*, the kind of vehicle used at Kocs, W. Hungary, 15th cent.). A C. is a large, enclosed 4-wheeled carriage for passengers. As a general term it may be used for all carriages (e.g. in C.-building), or combined with other words for special forms (e.g. stage-C., mail-C., hackney-C., mourning-C.). The typical C. however, has as special characteristics 4 wheels, springs, a roof forming part of the framing of the body, and more than 1 seat for passengers. It was perhaps a later development of the huge agric. wagons in use on the Continent in the 12th and 13th cents. In the Middle Ages very elaborate C.s were used by royalty and nobility and for State purposes. The first C. in England was made by Walter Rippon (1555) for the Earl of Rutland; in 1564 he also made one for Elizabeth I. This stage-C. had seats outside and in, and was much used in England as a public conveyance from the 16th cent. At least 6 existed in 1675, but they did not enter very largely into Eng. life till the 18th cent. In earlier times broad-wheeled vans or wagons were used to convey passengers who could not afford to travel on horseback. Fares were naturally

very high, as the pace was slow. At first there were no actual seats outside, but 'outsides' were taken at a reduced rate (about half-price), and had to cling on by the luggage as best they could. In 1767 a basket, called the convenience, was attached to the back of the C. for half-price passengers. In 1659 the first stage-C. ran between London and Coventry. In 1734 the mail-C. system was introduced by John Palmer, M.P. for Bath, to replace the post-boys who were employed up to that time. The post office vehemently opposed his suggestion, but it was carried out, the first mail-C. running between London and Bristol in 1784. In 1789 springs were introduced by John Warde, the 'father of fox-hunting.' Tubb and Davis's 'machine' was one of the first fast C.s that ran between London and Brighton. In 1791 lighter vehicles were introduced. Some C.s took only 11 hours to Brighton from London—'flying' C.s could even do it in 8. The fare for a single journey was 14s. or 16s. Before railways came into general use (c. 1840) C.s had regular routes all over the country; similar ones were used in America and on the Continent, where alternative names, such as *diligence*, *Stellwagen*, and *Elfwagen*, were used for vehicles of the kind. In the U.K. the 2 best-known C.s of historical interest are the queen's state-C. and the lord mayor's (which figures yearly in the procession of the Lord Mayor of London, 9 Nov.). This is the oldest, first used for the procession of Sir Charles Asgill, lord mayor elect, 1757. The body is hung on leather straps, and has much ornamental carving, gilding, and paintwork. The panels and doors are covered with various allegorical groups of figures and heraldic devices. The queen's C. was designed by Sir Wm Chambers and described as 'the most superb carriage ever built.' The paintings were done by Cipriani, the whole being completed in 1761. In the later years of Victoria's reign it was rarely seen, but on the accession of Edward VII it was again made fit for use on State occasions. In 1824 the art of coaching had been perfected; it was often a form of sport, and the custom of driving for high wagers was very popular. When the steam railway had ousted mail-C.s as a necessity, coaching still continued to a certain extent as an amusement for the richer classes. In the early 19th cent. McAdam and Telford improved road-making to such an extent that the conditions for driving were much pleasanter. Considering the unprotected state of the road, highway robberies were not so frequent as might be expected, though, of course, many tales of them survive (Dick Turpin). Much skill was needed to drive 4 horses, and the difficulties and humours of 'the road' are very often referred to in Eng. literature. From the sense of driving, the word C. came to be applied to a tutor for examinations or for athletic contests, especially rowing (army C., varsity boatrace C.). By 1824 over 300 C.s used to pass Hyde Park daily. The most famous coaching

clubs of England have been the old Bensington Driving Club, 1807-52, and the Four Horse Club, 1808-29. These drove a kind of landau. The Richmond Driving Club (promoted by Lord Chesterfield) was instituted in 1838. The Four-in-Hand Club was started in 1856, with the Duke of Beaufort as president, and the Coaching Club in 1870. In America the New York Coaching Club was formed in 1875. Coaching was chiefly the sport of the richer classes, but has been ousted by motoring. From 1896 coaching became a favourite pastime of Amer. millionaires,

Par. Clerks, issued 1732; 'Nimrod' (C. J. ... 1876; minton *Manual of Driving*, 1900; R. Straus, *Carriages and Coaches*, 1912; H. Belloc, *The Highway and its Vehicles*, 1926; T. Read, *The Evolution of the Horse-drawn Vehicles*, 1933; O. O. Winther, *Express and Stage-coach Days in California, 1835-1860*, 1936; B. Darwin, *British Clubs*, 1943; H. McCausland, *The English Carriage*, 1948.

Coachbuilding, or Coachmaking, term



Corporation of London: (Guildhall Library)

A MEETING OF THE FOUR-IN-HAND CLUB, HYDE PARK, LONDON
An aquatint by J. Harris after James Pollard.

but its true home was in England. Professional drivers of the 'Brighton Age' were Charles Jones, Sir St Vincent Cotton, Dick Brackenbury, and others. Robert Parks for 18 seasons in succession drove the C. from Keswick Hotel to Windermere and back (42½ m.) every week-day. The last sensational driving match was in July 1888, when James Selby drove the 'Old Times' from London to Brighton in 3 hrs 56 min., and back in 3 hrs 54 min., at an average speed of 12 to 13 m.p.h. In some parts of England (London to Brighton, Lake Dist.), in America and Europe, public C.s ran until comparatively recent years at regular times along certain routes. A modern C. has 2 parts, the carriage and the body. The latter typically measures 4 ft 10 in. long, 4 ft wide, 4 ft 2 in. high. They have brakes, but good drivers only need them in emergencies. The Amor. Concord C. has no springs, but leather straps. See *New Remarks on London*, by the Company of

originally applied to the building of horse-drawn carriages and coaches; in the modern sense, the name given to that section of the motor body industry where skilled craftsmen hand-build and finish vehicle bodies, as distinct from the mass production of bodies built with machinery and semi-skilled operators. The development of the motor body industry from the early days of the horse-drawn carriage has now divided into 2 parts, mass production, usually applied to the majority of private motor-cars, and C., referring to the private motor-car body individually hand-built to special order on a high-class chassis. The term C. is also applied to the production of the many different coach and omnibus fleets built in small batches for coach owners, as well as of special purpose trailers and caravans. A coachbuilt body is usually mounted on a separate chassis carrying the engine, transmission, wheels, etc., but latterly some coaches are of unitary construction, i.e. the body is the

main structure and the engine, wheels, etc., are added to it. This method has not yet been developed for private car bodies.

Formerly many different types of private car bodies were produced, but these have now resolved into the following main categories: fixed head 2- and 4-door saloon bodies; limousines with div. fitted between driver and rear compartment; estate cars with partition between passenger compartment and luggage space; miniature or 'bubble' cars running on small engines; and drop-head or convertible bodies such as 2-door coupé bodies, 4-door cabriolet bodies, and sports-car bodies without glass to the doors. Landauettes (with the rear part of the roof folding) and sedancas (with the front part of the roof sliding or folding) are practically non-existent now. Similarly, on the commercial side, the charabanc of the early 1900's, with its rows of forward-facing seats stretching the width of the body and separate doors to each row, has been superseded by the modern centre gangway coach and omnibus.

As so many different materials are used in the production of coachbuilt bodies, craftsmen skilled in many trades are employed. Ash, oak, beech, and birch plywood are the prin. timbers used, although owing to world shortage various substitute timbers have been tried. Mild and alloy steels, such as nickel and chromium, aluminium and various aluminium alloys are used for the body structure and panels, while brass, copper, glass, rubber, decorative timbers and veneers, leather, wool cloths, carpets, and paints are all materials used in the production of the finished motor-car.

After the body has been designed and drawn in the drawing office, the setting out dept lays out the size and shape of the various parts, making templates and jigs where required. Machinists in the wood-mill produce the necessary timber parts. Sheet metal workers produce floors and folded metal members, while fitters or engineers produce structural members and body fittings such as door stops, locks, special hinges and brackets, etc. Body-makers assemble and build the bodies to dimensions from templates, hang doors, make and slide the seat frames, etc., and panel beaters produce the body skin from flat aluminium or steel sheets. Panel fixers fix the shaped panels to the body, re-hang the doors, and correct the door lines and clearances. Brass workers make and fit such items as windscreen and door frames, mouldings, cover plates, etc., and also prepare these parts for chromium plating. Joiners make and fit the inside fascia boards, fillets, instrument boards, etc., which are then polished by polishers, while trimmers fit the headlining, make seats, trim the doors, fit carpets, and generally cover the body structure internally. Glaziers fix glass to windscreens, backlight, div., and doors, and ensure its easy raising and lowering. Painting a high-class coachbuilt car body involves priming, filling with oil base filler, rubbing down the filler to obtain a perfect finish,

then spraying with cellulose or synthetic paint and polishing to a high gloss finish. Mounters are employed to assemble such accessories as bumpers, wing undershields, headlamps, side lamps, etc., while electricians have to complete the complicated wiring of various internal and external fittings.

Basically these processes have not changed, but methods have improved and materials have altered since the early days of motor body C. Present day mild steels have replaced wrought iron, and aluminium alloys are being more widely used; glass fibre bound with synthetic resins is coming into use for structures. Many new adhesives are now available, and cellulose and synthetic paints have replaced oil base paints and varnishes. Vinyl interlayer for laminated safety glass has replaced celluloid, and the toughening process and shaping processes for glass have helped to change design. In the trimming field, polyvinyl chloride materials have replaced leather-cloth, while heavy quality polyvinyl chloride materials are now used for hoodings for drophead cars. Foam rubber and wire springing for seats has improved comfort and saved weight. Better draught sealing and the introduction of controlled heating and ventilation systems have now almost eliminated sunshine roofs, and with refrigeration units installed the modern coachbuilt car has complete air conditioning.

Coadjutor, in the Rom. Catholic Church, assistant of a bishop who is unable to perform his work owing either to ill health or old age. He often succeeds to the bishop's see when that dignitary dies.

Coagulation, change which occurs in the physical properties of certain proteins when heated or subjected to various chemical actions. The typical examples are egg albumin, or white of egg, which is a colourless, sticky fluid, miscible in water at ordinary temps., but solidifying into an opaque white mass when placed in boiling water; and blood albumin, which clots on exposure to the air, thus serving a useful purpose in preventing escape of blood from small wounds. See **THROMBIN**.

Coahuila, inland state of NE. Mexico, bounded on the N. by the U.S.A. Area 58,067 sq. m.; pop. (1950) 720,619. The climate is salubrious, although there are somewhat rapid changes in the thermometer. Agriculture, cattle-farming, and mining form the chief occupations. It is the main Mexican state in which coal is produced (1,432,000 metric tons in 1953). This state is rising in importance owing to the extensive railway development; it possesses 5 dsts., and the chief products are cotton, wheat, maize, sugar, and tobacco. Its cap. is Saltillo (70,000).

Coal, that form of fuel which is obtained as a mineral from pits. It is one of the organically formed rocks, and occurs chiefly in the C. measures. It consists chiefly of carbon, hydrogen, and oxygen, and is derived from plant remains. It is a black or blackish-brown rock, with a low sp. gr. C. may be divided into (1) *Bituminous*, (2) *Anthracite*. *Lignite*, or

brown C., is a stage in the conversion of vegetable matter into bituminous C. Graphite is the final stage in the transition. In the Carboniferous age great masses of luxuriant vegetation grew near sea levels. As the land covered with this vegetation became submerged, sediments of mud and sand, etc., formed over it. When this land became raised again above sea level, new vegetation grew, which, in its turn, would undergo a similar treatment. These processes would at length produce stratified measures, which, under the ensuing great pressure and certain chemical changes would result in the formation of seams of C. The table below (compiled by Prof. J. W. Gregory) gives results of analysis, excluding nitrogen and sulphur.

which gives bituminous C. Microscopic examination shows that C. consists of 4 main constituents, called durain, clarain, fusain, and vitrain. As a whole, C. appears to be a colloid (q.v.), but the general structure is complicated and variable.

All C., as would be expected from its vegetable origin, contains a proportion of nitrogen, and is important as the source of the ammonia obtained as a by-product in the manuf. of C. gas.

The effect of heat on C. in the absence of air varies according to the conditions, especially the temp. (see CARBONISATION (Low Temp.)). Gaseous and liquid products are always found, however (see COAL TAR and GAS MANUFACTURE), while a residue of coke (q.v.) is left in the retorts.

	Carbon per cent	Hydrogen per cent	Oxygen per cent	Ash per cent	Moisture per cent
Air-dried Wood	39	4.5	35.5	1	20
Air-dried Peat	44.5	4.5	26.5	8.5	16
Air-dried Lignite	45	3.75	26.25	10 *	15
Bituminous Coal	72	4.0	11.0	10 *	3
Anthracite	91.5	2.5	1.0	3	2
Graphite	95	—	—	5	—

* Very variable.

Anthracite is always found deeper in the earth than bituminous, bituminous than lignite, and peat on the surface. The deeper the layer, the greater the heat and the pressure, and as a result the greater is the evolution of the separating gases, and an increasing percentage of the C. will be carbon, the sp. gr. will rise, the colour darken, and we shall arrive at a rock formation. If the leaves and branches of trees accumulate a mould will be formed, rich in carbon, while mosses growing in swamps will form peat. If either or both be buried, the carbonaceous layer will be preserved. Heat and pressure will cause the volatile elements to pass off, leaving lignite. Greater pressure will resolve this into bituminous C., while the same process intensified will produce the hard lustrous form of C. known as anthracite, which is free of dust and will burn without smoke or flame. It might also be formed by the intrusion of igneous rock. Igneous rock, having intense heat, flowing into dykes in this anthracite would convert it into graphite, which is practically pure carbon. This theory is partly illustrated in the S. Wales coal-field. If we pass from the SE. to the NW. of the field, we pass from bituminous C. seams through steam C. to the anthracite, steam C. being intermediate in composition and properties between the bituminous and anthracite. Not all graphite formations can be ascribed to this process; and in some cases anthracite and bituminous C. occur together, and seem to have been formed under the same conditions. It has been thought that anthracite C. may be formed from a different kind of vegetation from that

Lignite (q.v.) is sometimes termed brown C., although it is inferior to true C. It is, however, used a good deal in Germany and N. America, where a variety is found which cokes well.

Bituminous coals form the greater part of the C. measures, and are the forms in general use for domestic and commercial purposes. They are black, brittle, and opaque, and have a cross-jointed structure, often breaking into rhomboidal or cubical fragments. They have a sp. gr. of about 1.3, and, if they are good varieties, will give 10 per cent ash or less. This ash, or incombustible inorganic matter, occurs in all C.s, and consists of sand and mud which has mixed with the layer of C. at the time of its formation. In some C.s (mainly continental) the percentage of ash may rise to over 30. When a large amount of these impurities enter, causing a great lowering of the value of the seam as fuel, it is called bituminous shale or sandstone, not C. From some of these shales and cannel C., oil is obtained by distillation. Bituminous C.s are also used for obtaining gas. They are heated in closed retorts, and the C. gas, together with C. tar and ammonia, is formed, leaving coke as a residue. This coke is practically carbon, and is used in smelting. There are many different varieties of bituminous C., and sev. ways of classifying them are adopted. In S. Wales the general classification is into house C. and steam C. Under the first heading are placed C.s with a fairly low percentage of carbon which, possessing comparatively large amounts of occluded gas, will burn with a large amount of flame. These seams are found all over the coal-field.

and are those nearest the surface, in some places outcropping from the mountainside. The steam C., on the other hand, is always derived from pits of a fair depth. It has a higher percentage of carbon, is harder, and has a greater lustre; and as a consequence of its comparatively small amount of composing gases, it burns without a great deal of flame or smoke, and has a greater amount of available heat. Local names are given to those seams which are first worked near them, and these names remain with the seams wherever they may be worked. This will be seen from the names Wallsend, Derby Brights, Mynyddyslwyn, etc.

also. It is much used as a gas-producing C., and also in some dists. for burning in open grates.

Anthracite (q.v.) is a hard, rocky form of C. with an almost metallic lustre. It is difficult to kindle, but when burning it gives out great heat. It is found in the W. of the S. Wales coal-field and also in America. It burns practically without smoke and flame, and has a greater heating power than any other form of C.

Heating power of coal. C. is judged by the number of pounds of water which will be raised 1° F. by the burning of 1 lb. of the fuel, by the amount of water evaporated at 212° F. by 1 lb. of it, and these



National Coal Board

COMRIE COLLIERY, FIFESHIRE

General view, showing the two shafts and pithead baths.

Steam C. is intermediate between bituminous and anthracite C., and the finest steam C. in the world is that found in S. Wales and Monmouthshire. While only anthracite is found in the W., bituminous and steam C. can be found right to the E. of the field. The Monmouthshire coal-field contains vast supplies of steam C. which are not inferior to those of Glamorgan, and they are at present being developed. Caking C.s burn freely, with great flame and smoke, but as they cake into clinkers, these prevent perfect combustion, and require efforts to free them from the fire-bars. Non-caking C.s burn free, and since the ash remains separate, are easy to stoke. Newcastle C. is among the caking varieties. Among other well-known forms of bituminous C. may be mentioned splint C., a hard C., found in Scotland, which is used in smelting. Cannel C. burns with a crackling noise, and is therefore sometimes known as parrot C. It is hard, and does not soil the fingers, and some forms of it can be polished and made into inkbands, etc. Some forms of Amer. C. are capable of this

tests are always carried out on boilers of the type in which it is to be used, for it is found that the heating power of any variety of C. varies considerably, according to the conditions under which it is to be burnt. See E. S. Moore, *Coal, its Properties, Analyses, etc.*, 1922; A. L. Summers, *Anthracite*, 1922; W. A. Bone and G. W. Hinus, *Coal, its Constitution and Uses*, 1936; P. J. Wilson, Jr. and J. H. Wells, *Coal, Coke, and Coal Chemicals*, 1950; D. H. Bangham, *Progress in Coal Science*, 1950; Wilfrid Francis, *Coal*, 1954; *Colliery Year Book and Coal Trades Directory* (annual). See also bibliographies for COAL-FIELDS; COAL-MINING; COAL SUPPLIES.

Coal, Hydrogenation of, conversion of coal into a mixture of oils by treatment with hydrogen. The best method of hydrogenation is that of Bergius, which consists, essentially, of converting coke into a mixture of hydrogen and carbon monoxide by heating in steam and purifying the mixed gases from sulphur. The next stage is to oxidise the carbon monoxide to carbon dioxide,

which is effected with further steam heating and a catalyst. The carbon dioxide is then removed by water under a pressure of 750 lb. to the square inch, and the hydrogen is freed from any remaining traces of carbon monoxide by treatment with a solution of copper compound and ammonia. The coal, having been cleansed by flotation, is then mixed with creosote oil and a catalyst and ground to a fluid paste, which latter is heated, with the hydrogen, at a pressure of 250 times that of the atmosphere. It is thus converted into a mixture of oils which, on fractional distillation, can be separated into petrol and heavy and middle oil. Some 4 tons of coal are required to yield 1 of petrol, and the ensuing petrol is of good quality and volatile.

Coal, Low Temperature Carbonisation of, see CARBONISATION.

Coal-fields are constituted of those areas where the coal-bearing strata appear at the surface, or where their coal and ironstones can be worked at a profit. In England very few workable seams are found lower than the coal measures or the Upper Carboniferous div. of the Carboniferous system. The 2 other divs. are the millstone grit and the carboniferous limestone. In Scotland, however, valuable seams are found lower than the millstone grit, while oil shale is obtained even below the Carboniferous limestone. Coal is, however, worked from other strata both older and younger than the Carboniferous, being worked from the Devonian, Miocene, Pliocene, Oolitic, and other formations, although coal obtained from these seams is of relatively small commercial value as compared with that obtained from the coal measures. C. are usually found in the form of a syncline or basin, dipping inwards at the edges and lying more or less level at the centre, thus causing the seams to crop out very frequently at the surface. This allows the coal to be easily reached and worked, and has saved the C. from the destroying effects of denudation, to which they would have been very susceptible owing to the comparative softness of the coal-bearing strata. Among the many C. in the Brit. Isles are the following: in the neighbourhood of the Bristol Channel, the S. Wales coal-field, and that of the Forest of Dean, with a small one at Bristol; in the Midlands occur the C. of Leics, E. Warwicks, S. Staffs, Coalbrookdale, Shrewsbury, and Flint; around the Pennine chain occur those of N. Staffs, Yorks, Lancs, Durham, Northumberland, and Cumberland; in 1953 the existence of a new coal-field in S. Derby, around Repton, possibly extending into Leics, was proved; in Scotland occur the Lanarkshire, Ayrshire, and M'fieshire, and in Ireland the Tyrone, Kilkenny, and Clare C. The S. Wales coal-field is famous all over the world as providing the greater proportion of the steam and anthracite coals used in the various mercantile marines and navies, while at the same time it provides coals of the kinds suited for smelting, manufacturing, and house coals, together with those varieties used in the production of

gas. The coal from the Midlands and the N. is generally used in all these branches, but it is not of such great value for shipping purposes, and it is chiefly used in the great manufacturing and engineering centres of the N. The largest C. are probably those of America, which are over 80 times as large as the whole of those of Great Britain, covering as they do nearly 200,000 sq. m. The term coal is used in the U.S.A. with no such narrow restriction as in England to varieties occurring in the older Carboniferous formations; but, as on the continent of Europe, includes anthracite and bituminous coals, lignitic coal, cannel coal, and ordinary lignite. The coal output of the U.S.A., no less than the splendid quality of the numerous varieties, surpasses that of any other country. The coal-bearing areas are to be found scattered over more than 30 of the states, and indeed it is only in a few of the New England states that no coal occurs. The Appalachian mt system, extending from E. Pennsylvania to the S., indicates the line of the prin. coal-bearing country, and it is here that the most valuable deposits of hard anthracite are to be found. The group of fields of next importance is the E. interior group in Illinois, Kentucky, Indiana, Ohio, where are to be found the best qualities of bituminous and cannel coal. In the W. interior group of Missouri, Iowa, Kansas, the output of the same varieties is no less important. Next in importance come the large lignitic and bituminous C. of Arkansas, Texas, Oklahoma, Colorado, and New Mexico, which last-mentioned fields continue along the line of the Rockies northward into Canada. Anthracite also occurs in Massachusetts, Arkansas, and Virginia; bituminous coal in Nebraska, Michigan, and Alabama; and lignitic coal in nearly all the states W. of 105° W. long., especially New Mexico, Colorado, California, and Utah. Lignite is found mainly in the W. states. Speaking geologically, the better qualities of both the anthracite and bituminous coals belong to the Carboniferous formations, but the quality varies only to a very uncertain degree with the geologic age, and it is curious that whereas up to about 1870 more anthracite was mined in Pennsylvania than bituminous coal throughout the country, since that year the production of bituminous coal has far exceeded the former. According to the U.S. Geological Survey, the geologic age of the coal-beds ranges from Carboniferous in the Appalachian and Mississippi valley provs. to Miocene on the Atlantic coast provs. After Great Britain and the U.S.A., Germany is the prin. exporting country. (See statistics under COAL SUPPLIES.) The partition of Silesia, with its rich coal-field, was hotly contested after the First World War, and settlement was attempted by plebiscite in 1920. Eventually the mining area of Teschen, Lower Silesia, formerly Austrian, was allotted to Czechoslovakia, already rich in minerals, while Upper Silesia, formerly German, was given to Poland.

Other productive European fields are located in Belgium (Charleroi, Mons, Liège; and the Kempen, yet to be exploited), France (St Étienne), Germany (Westphalia and Rhineland), Spain (Asturias), and Russia (Donetz), while coal is also found in the Alps, the Urals, and at Spitsbergen. Other C. are those in China, India, Japan, the Malay Archipelago, Australia, New Zealand, S. Rhodesia, S. Africa, and Canada. Most of the Chinese provs. contain coal, and China, judging by its immense estimated resources, may be regarded as one of the leading coal countries of the world. Japan and India, however, actually produce considerably more coal than China. Except in Nigeria and S. Rhodesia, little coal is produced in the Brit. Colonial Empire. Coal deposits are extensive in the SW. of Tanganyika. Coal is not the only commercial product obtained in the C., for included in the same strata are ironstone, oil shale, fire-clay, sandstone, and igneous rocks which supply a good paving and building stone, in fact the oil shales and sandstones usually make up by far the greatest proportion of the thickness of the coal-bearing strata. See also CARBONIFEROUS SYSTEM and GEOLOGY. See Sir A. G. Ramsay, *Physical Geography and Geology of Great Britain*, 1863; E. A. N. Arber, *The Natural History of Coal*, 1912; J. Park, *Mining Geology*, 1918; J. Lomax, *Microstructure of a Coal Seam*, 1925; E. A. Martin, *Coal and its Story*, 1926; B. E. Dahlgren, *A Forest of the Coal Age*, 1933. See also bibliographies for COAL; COAL-MINING; COAL SUPPLIES.

Coal-fish, Greencod, or Saithe, or *Gadus virens*, is a member of the cod-fish family. It is carnivorous and is itself eaten by man, and on the W. coast of Scotland is often caught in great abundance, as it preys on herring. The fish inhabits the seas between the Arctic and the Mediterranean, and is sometimes known as C. from the dark colour of its back.

Coal-mining. *Prospecting and exploration.* In prospecting for coal a knowledge of geology is essential in order to determine whether the rocks belong to the Carboniferous system. In countries where C. operations are in progress, valuable information may be obtained from neighbouring collieries, and records such as the Brit. Geological Survey memoirs and maps. In most cases, the coal outcrops have been worked away, but their former existence may be marked by blackened earth or old rubbish heaps. The bed of a stream may contain coal fragments derived from some outcrop of a seam. Where the nature of the rocks indicates that coal exists in the area, the expense of boring to prove it may be justified. Two, three, or more boreholes are put down at points selected from the geological survey. These boreholes will provide information regarding (a) the number, thickness, and quality of the seams, (b) the nature of the rocks through which the shafts will have to be sunk, (c) the depth from the surface of the individual seams, (d) the amount and direction of dip, (e) the presence of water, and (f) the existence and position

of faults, which information will help to determine the best location for the shafts. It is then possible to estimate the expense of sinking the shafts; the total quantity of coal available; the cost of working and the probable profit. The boring methods may be classified under 2 main systems: (1) *Percussive* system, carried out with free-falling tools, or (2) *Rotary* system, which involves the cutting out of a solid core of the strata passed through. Generally, the second method is preferred, as the rock cores enable a complete record of the strata passed through to be obtained.

Sinking and fitting shafts. The best position for sinking depends upon (a) the proximity of a main railway; (b) the existence of a good road for transport; (c) the limitation of underground roadways; (d) the presence of faults which may damage the shaft; and (e) the presence of a supply of clean water for steam boilers, etc. In mountainous areas, valleys are naturally preferred for shafts as they ensure the minimum depth to reach the coal. With dipping seams, the shafts are often sunk to the deeper part so that the bulk of the coal and water will gravitate to the shaft bottom and thus save power. Normally, the shafts are sunk near the centre of the taking so as to limit the length of haulage and ventilation roads in all directions. The law requires that at least 2 shafts, 15 yds or more apart, be sunk to work each independent coal taking. One will act as the *downcast* or ingress and the other as the *upcast* or egress. Both shafts must be provided with winding gear for the conveyance of workmen. The shaft must be adequate in size, and the factors which determine this are (a) the required daily output of coal; (b) the total quantity of coal in the taking; (c) the period of the lease (in England it varies from 30 to 99 years and in Scotland from 20 to 30 years); and (d) an additional space must be allowed for water and compressed-air pipes and ventilation. The above information will determine the size of the tubs or trams for carrying the coal, the size of the cages in the shaft, and finally the size of the shaft itself. Engineers are nowadays generous in shaft sizes to allow ample space for ventilation. In Great Britain, shafts up to 24 and 25 ft in diameter are not uncommon. A depth of 4000 to 5000 ft is considered to be about the maximum at which coal can be profitably mined in Great Britain. There is a great variety of shaft forms, such as the rectangular, octagonal, elliptical, and circular. The rectangular is easy to secure with timber and divide into compartments. The circular shape is the strongest and can be lined easily with brick, concrete, or cast-iron tubing. The circular is the form usually adopted in England and Wales. When sinking through the incoherent surface deposits, special precautions are necessary. Sometimes beds of water-logged gravel or quicksand will render the sinking difficult and necessitate special methods. Having reached the hard rock, the sinking operations include blasting and excavating,

removal of debris in special buckets, raising the water, and finally lining or supporting the shaft sides (*see SINKING*). When the coal is reached, the mining engineer provides for the protection of the shaft and surface buildings from damage, due to ground subsidence, by leaving a large pillar of coal around the shaft bottom.

Methods of working. When the shafts have reached the coal and the shaft pillar is formed, the method of working the seam must be decided. In the longwall method, the coal face is opened out at the edge of the shaft pillar and the whole of the seam removed in one operation. The space from which the coal has been removed is completely or partly filled with dirt obtained from the seam or the rock beds above or below the seam. This area filled with dirt is known as the goaf or gob, and through this all roads to gain access to the coal face are maintained. In the pillar and stall method, the seam is divided into rectangular pillars by driving stalls or boards at right angles to each other.



FIG. 1. TIMBERING IN COAL FACE

After a certain area of coal has been split up into pillars, the work of extracting them is commenced. There are numerous modifications of these 2 main systems to meet the varying conditions. As a general rule, seams of 4 ft or under in thickness are worked longwall, and seams over this thickness by some form of pillar and stall. The system of working to be adopted will depend upon (a) the thickness and inclination of the seam; (b) the depth below the surface; (c) the nature of roof and floor; (d) the presence of gas or water; (e) the presence of old workings; (f) the existence of valuable surface buildings requiring protection. In *longwall advancing*, the coal is worked from the shaft pillar towards the boundary, while in *longwall retreating* the main roads are driven to the boundary and the seam is worked backwards towards the shaft. The bearing of the main roads driven from the shaft bottom varies with the haulage requirements, the inclination of the seam, and the position of the shaft relative to the coal taking. The advantages of the longwall system of working are (a) it is very suitable for machine cutting and conveying; (b) concentration of men; (c) the ventilation is better; (d) better roof control and therefore greater safety. Fig. 1 shows a section across a longwall coal face, with the goaf packed with dirt, props for supporting the roof, and a sprag to hold the face slip until the miner is ready to work it. The pillar and stall method is usually adopted in thick seams or when

working under valuable property or water, in which case the pillars are left to support the strata.

Timbering. The roof and sides of mine roadways and coal faces must be supported and made secure to prevent accidents and to maintain traffic and ventilation. Ordinary timbering will only resist the minor pressure caused by the

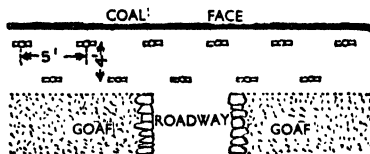


FIG. 2. PLAN OF SYSTEMATIC TIMBERING

weight of the rock immediately above the coal. The major rock pressure is irresistible and can only be controlled by systematic packing of the goaf. In Northumberland and Durham, a special body of trained men are employed in each pit to do this work, while in Wales, Lancs. and Scotland, the colliers do most of the timbering required in their places. At the coal face single props are set with a lid on top. This lid distributes the pressure over a greater area. With hard floors, the feet of the props are often tapered to prevent their crushing when the roof weight comes on. With soft floors, a sole piece is often placed under the prop as well as above it. Another method used in the coal face and on the sides of roadways is that of chocks consisting of pieces of wood placed in the form of squares, which are built up to the roof and wedged tightly. Fig. 2 shows the systematic timbering method being applied in a longwall face.

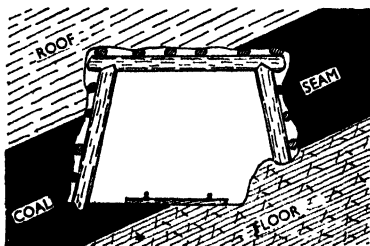


FIG. 3. TIMBERING IN INCLINED SEAM

Roadways are usually supported by means of a cross-bar and props, although when only the roof requires securing, a cross-bar alone may be sufficient. Fig. 3 shows double timbering in an inclined and moderately thick seam where part of the hard floor is removed for headroom. The joint between the cross-bar and the uprights is known as the Welsh notch.

In the case of wide roadways, the cross-bars are sometimes supported by a centre prop. Nowadays, main roadways that require supporting are lined with brick or reinforced concrete arches, or by brick side walls with steel girders as cross-bars. Semicircular steel arches are now a frequent method of supporting roadways. These are placed 2 to 4 ft apart with tie-rods to secure them one to the other. This method of support is less cumbersome than wood and it is fireproof and not liable to decay. Even at the coal face, steel is gradually replacing wood. Steel props may be cylinders or girders. The chief methods of preserving mine timber are thorough drying before use, stripping the bark, and the use of preservatives such as zinc chloride, copper sulphate, iron sulphate, lime, and creosote (from tar). The timber in return airways is usually sprayed with a solution of copper sulphate at regular intervals. In America, shaft timber is often sprayed with cement, which renders it fireproof and fungus-proof.

Winning the coal. Most seams have joints or cleavage planes, and there is always one direction along which the coal will yield most readily. The cleats in the coal are known as back or face slips, depending on the direction from which they are worked. When the slips are as shown in Fig. 1 the miner works away the lower part or butt, when the coal can be readily parted slip by slip. The miner's tools consist of picks, shovels, hammers, wedges, and hatchets. Drilling machines are worked either by hand, electric power, or compressed air. They are used for boring in the seam, roof, or floor to blast it loose. When the seam has been undercut, sprags may be necessary to hold the coal until the loading commences. A sprag is an inclined prop against the coal as shown in Fig. 1. If the coal is hard, it may be necessary to use mechanical wedges or

cutting a groove or channel to a depth of 3 to 6 ft as it travels along. The disk machine acts in principle like a circular saw laid horizontally. In the chain machine the cutters are fixed to an endless chain resembling that of a band saw. The bar machine carries teeth along its length and in action resembles a saw-file. Different types of conveyors are in use, the

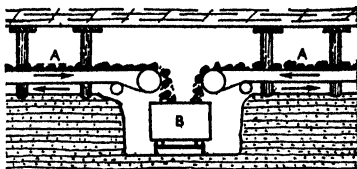


FIG. 4. FACE CONVEYORS

most popular being the belt, jigger (or shaker), and the scraper chain. The conveyor extends the whole length of the coal face and delivers the coal either into the tubs at the roadway or on to a gate or main conveyor. There are machines now in operation which simultaneously cut and load the coal on longwall faces, which may be 100 yds in length, and give an output of 250-300 tons of coal per shift. Fig. 4 is a section along a coal face showing 2 face belt conveyors (A) delivering coal on to a tub (B). In some cases these face conveyors deliver the coal on to a gate conveyor, which in turn discharges into tubs some distance back on the gate road.

Haulage of coal underground. There is a great variety of haulage systems in use underground. The system to be adopted depends upon (a) the amount and direction of gradient; (b) the regularity of gradient; (c) the daily and total tonnage of coal to be hauled; and (d) the power available. Mine trams (or tubs) are usually built of steel or steel alloyed with copper to prevent corrosion. Locomotives, which are popular in America, may be driven by petrol, electric power, or compressed air. Safety from fire or explosions is obtained by using compressed air or storage battery locomotives. In Brit. mines, electric and compressed-air power are favoured for haulage purposes. Electric power is largely confined to the main haulage planes where the ventilation is good, and compressed air is preferred for the inbye haulages. Where the full tubs have to be brought downhill on an inclined plane a self-acting incline can be used. In this case, the gravity pull of the full tubs is utilised to haul up the empty tubs. Sometimes full tubs haul a bogie containing iron weights up the incline, and the bogie, when descending, hauls up the empty tubs. The endless-rope system of haulage is greatly favoured on long, fairly flat roadways. One endless rope travels continuously in one direction. The trams are attached to the rope in various ways, and can be attached or detached by hand or by other means.



For Photos

MINERS BREAKING COAL FOR REMOVAL IN TUBS

even shot-firing to bring it down. In gassy or fiery mines, only certain specified explosives may be employed.

Coal face machinery. A coal-cutting machine consists of a motor which works either a disk, chain, or a bar type of cutter. A longwall coal-cutter is fixed at one end of the coal face and by means of a rope or chain is hauled along the face whilst

Coal winding. The coal tubs, on reaching the shaft bottom, are run into cages. Two cages are provided in each shaft, one ascending while the other descends. The cages are guided in the shaft by wood, rail, or wire-rope guides. Each cage may have from 1 to 4 decks, each deck holding 1 or more tubs. Totally enclosed double-decked cages of wrought iron or steel and holding 2 tubs on each deck are common. The cages are attached to the winding rope by chains. Winding ropes are now almost exclusively made of plough steel owing to its great tensile strength, elasticity, and wearing qualities. A plough steel rope has a breaking stress of 95-125 tons per sq. in. The load on the winding engine varies considerably during a complete wind, being a maximum at the start. To counterbalance the weight of the winding rope, a rope is fixed to the bottom of each cage and run around a pulley at the bottom of the shaft. If this tail rope equals the weight of the winding rope, the dead load on the winding engine is only that of the coal. Coal winding is sometimes performed by the skip or bucket method which, in conjunction with face and gate-road conveyors, is a further step towards the elimination of tubs underground.

Mine gases. The chief noxious gases with which miners are concerned are firedamp, carbon dioxide, and carbon monoxide. Firedamp, methane, or carburetted hydrogen, is the most common mine gas. It is colourless, odourless, tasteless, and a non-poisonous gas, although it will cause suffocation when breathed, owing to the absence of air. Since it is only about half as dense as air, it is generally found near the roof or in cavities. When mixed with air in certain proportions it is very explosive. Its presence in mine air is detected by its effect on the flame of a miner's safety lamp, on which a bluish cap is formed when sufficient gas is present. Firedamp is given off from the coal and the surrounding rocks, sometimes suddenly as 'blowers.' Carbon dioxide also exists in varying small quantities in coal and is produced by the combustion of carbonaceous material, the burning of lamps, and the breathing of men and horses. It is a colourless and odourless gas and, being about one and a half times as dense as air, it gathers near the floor and in dip workings. This gas will not burn, neither will it support combustion. It is detected by the dimness of the flame of a safety lamp, and the flame is extinguished when large quantities are present. When breathed it causes fatigue, panting, and headache according to the amount present. Carbon monoxide is principally produced as a result of gob fires and by the explosion of firedamp and coal dust. It is a colourless and odourless gas, slightly lighter than air. This gas is a very deadly poison and the breathing of even minute traces will cause poisonous effects. The symptoms of carbon monoxide poisoning are breathlessness and palpitation, severe headaches, drowsiness, or collapse according to the amount present.

Ventilation. The prin. function of ventilation is to convey fresh air to all parts of the mine and to carry away gases and waste products, and thus provide a safe and wholesome atmosphere in all parts where men work or travel. In certain small mines, the ventilation is natural, owing to a difference in the upcast of the air in the downcast and the upcast.

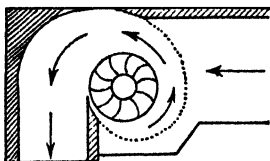


FIG. 5. VENTILATING FAN

Natural ventilation is, however, unreliable, and is always liable to cease or even change its direction according to the season of the year. The Coal Mines Act, 1911, of Great Britain states that a place is not fit to work in if the air contains either less than 19 per cent of oxygen or more than 1½ per cent of carbon dioxide. Formerly, many mines were ventilated by steam jets, waterfalls, or furnaces. Fans are almost



FIG. 6. AIR CROSSING

exclusively used nowadays. These are either exhausting or forcing fans. The former exhausts the air from the top of the upcast shaft, while the latter forces the air down the downcast shaft. Most fans are of the exhausting type (Fig. 5). The air current which is created by a fan must be circulated throughout the mine. This is accomplished by ventilation doors, air-crossings, brattices, etc. When the air

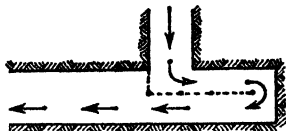


FIG. 7. USE OF BRATTICE

current has to be deflected or turned at branch roads a door is used, which can close automatically. When an intake airway crosses a return airway, an air-crossing, as shown in Fig. 6, is constructed to prevent the 2 currents mixing. Brattice sheets are sometimes necessary in narrow places to direct the air to the working face as shown in plan in Fig. 7.

Pumping. The following systems of dealing with pit water are employed according to circumstances: (a) raising water in chests or tanks from dip workings; (b) winding water in barrels in shafts; (c) removing water by means of siphons; and (d) removing water by means of pumps driven by steam, compressed air, or electric motors. When the quantity of water to be dealt with is small, tanks or barrels are used to remove it to the surface. With greater quantities it is usual to employ pumps of various types. Of late years great strides have been made in the use of 3-throw, centrifugal, and turbine pumps driven electrically. Sev. of these pumping units may be installed between the workings and the surface, one pump delivering its water to the next pump and so on until the surface is reached.

Lighting of mines. The various methods of mine lighting are (a) oil safety lamps,



Fox Photos

and (b) electric lamps. The danger of using candles and open lamps in mines is that the pressure of firedamp in the right percentage would cause an explosion. An oil safety lamp is one which has its flame protected in such a way that it should not ignite firedamp if present in the air. Sev. types of oil safety lamps are in use, being modifications of the original Davy, Stephenson, and Clanny lamps (see DAVY LAMP). Electric safety lamps are now made of satisfactory design, either to be carried by hand or worn in the hat. They possess many advantages over the oil lamps, and are now very popular in Great Britain, U.S.A., and Canada.

Sorting and cleaning. When the coal reaches the surface, the tubs are run on to a weighing machine and the weight is registered. They are then run on to a revolving 'tippler,' where the coal is discharged on to either a fixed bar or a jiggling screen which separates the small from the large coal. The large coal passes on travelling belts to picking belts or tables where pieces of shale are removed. From there it is either subjected to further screening and sizing by machines or loaded direct into railway wagons under-

neath. The removal of dirt on the picking belts is only a preliminary cleaning, as small coal and some varieties of large coal are so full of impurities that they can only be efficiently cleaned by washing in water or other liquid. There is a large variety of coal washers but the principle in all cases is more or less the same. If raw coal be placed in an upward current of water of a certain velocity, the coal particles will be carried upwards by the stream, but the impurities such as shale, being heavier, will descend through the upcoming water. This principle is used in all coal-washing plants.

Bibliography. O. Guttman, *Blasting: a Handbook for the use of Engineers and others engaged in Mining, Tunnelling, Quarrying, etc.*, 1892, 1906; S. H. Cox, *Prospecting for Minerals* (3rd ed.), 1903; J. Tongo, *Principles and Practice of Coal Mining*, 1907; H. F. Bulman and R. A. S. Redmayne, *Colliery Working and Management*, 1912, 1925; M. H. Haddock, *Mine Ventilation and Ventilators*, 1924; J. Kirsopp, *Use of Power in Colliery Workings*, 1926; K. Neville Moss, *Gases, Dust, and Heat in Mines*, 1927; J. Park, *A Text-book of Mining Geology*, 1927; J. Roberts, *Mining Education* (2 vols.), 1927; I. Thomas, *Coal in the New Era*, 1934; E. N. Zern, *Coal Miner's Pocket-book*, 1938; H. C. Price, *Notes on Spontaneous Combustion in Coal Mines*, 1945; H. R. Wheeler, *A Manual of Modern Underground Haulage Methods for Mining Engineers*, 1946; T. Bryson and A. Harvey, *Science for Miners*, 1946; I. C. F. Statham, *Coal Mining*, 1950; R. McAdam, *Colliery Surveying*, 1953; *Mining Year Book* (ann.).

Coal-tit, Coal-titmouise, or Coalmouse, popular name for *Parus ater*, a small species of Paridae with a black head and dull-coloured body.

Coal Gas, see GAS MANUFACTURE.

Coal Measures, see CARBONIFEROUS SYSTEM; COAL-FIELDS; GEOLOGY; PALAEONTOLOGY; PETROLOGY.

Coal Mines, Nationalisation of. By the Coal Act, 1938, a Coal Commission was constituted, in which was vested, as from 1 July 1942, the ownership of all coal (and certain associated minerals and rights), with the duty of exercising their functions as owners 'in such manner as they might think best for promoting the interests, efficiency, and better organisation of the coal-mining industry.' The aggregate amount of compensation to be paid by the commission for coal and coal rights was fixed by the Act at £66,450,000, with additional sums for other associated property and rights; and the commission might borrow up to £76,450,000 for the payment of compensation and other expenses payable by them. The valuation of separate coal holdings, as registered under the Coal (Registration of Ownership) Act, 1937, was carried out by valuation boards appointed by the Ministry of Fuel and Power, and payment of the compensation completed. The commission was also charged with duties of promoting amalgamation of colliery undertakings in any

area in which they considered the number of separate undertakings to be so great as to be detrimental to the efficient working, treating, or disposing of coal. After the Second World War, the Coal Commission was replaced by the National Coal Board, constituted under the Coal Industry Nationalisation Act, 1946, and a tribunal was set up to determine the global sum of compensation to be paid for certain assets of the coal industry to be transferred to the Coal Board. The tribunal fixed the amount of compensation at £164,660,000. The assets transferred may be described broadly as the assets of the coal industry, excluding assets such as coke ovens and by-product plant. The award is dated 1 Aug. 1946. In pursuance of an order made under the Coal Mines Nationalisation Act the transfer of the C. M. to national ownership was effected on 1 Jan. 1947.

Coal Supplies. On the initiative of the XIIth International Geological Congress, which met in Toronto in 1913, an inquiry was made into the C. S. of the world. Actual world resources were estimated in metric tons at 716,154,000,000, while the possible and probable reserves totalled 6,681,399,000,000.

A list of the European coal-producing countries and their production (1954) is given in Table 1. Table 2 gives production and consumption in the U.K. for the first quarter of 1955, and Table 3 the production and export for 1934-8, for comparison. In view of the large output of the U.K. fields and their comparatively small size, thought has been given to the possible exhaustion of our C. S. Two royal commissions have thoroughly studied the subject, one being under the chairmanship of the Duke of Argyll, and the other under Lord Allerton. The first of these commissions pub. its report in 1871, and the conclusion reached was that the attainable amount of coal in the known coal-fields was 90,207,000,000 tons, and the probable amount available in other places was 56,273,000,000 tons, thus making a total coal supply of 146,480,000,000 tons. The second commission reported in 1905 that the net estimate of unworked coal was 100,915,000,000 long tons. This allowed for all possible losses, but at the same time it was recognised that inferior coal and small coal, hitherto discounted, had become of use to sev. important industries, such as the patent fuel trade and the gas and by-product industry. In 1913 Dr Strahan compiled the report in Great Britain for the XIIth International Congress, basing his statistics on the findings of the 1905 commission, modified, however, by further exploration. Estimates were reckoned to a depth of 6000 ft, as against the 4000 ft hitherto held to be the limit, and the total reserve of coal for the U.K., including Ireland, was put at 189,434,749,920 metric tons. Less than 10 per cent of this reserve is anthracite. The Samuel Coal Commission, 1925, basing its assumption on the figures of previous estimates, reported that at the present rate of output the actual reserve

of coal, mined at a depth of 4000 ft, would last 5 centuries. Taking into account all probable reserves, including the possibility of mining at a depth lower than 4000 ft, the reserve would last 7 centuries or more. At the same time, coal consumption has increased to the extent that production at the present rate is insufficient to cover the demand. Increased productivity is necessary to meet the expected demand for 250 million tons per annum in 1965. A specialist group of the Brit. Productivity Council pub. a report in Sept. 1953, recommending (1) a declaration by the gov. that it envisaged the country's almost complete dependence on coal for 30 years; (2) Investigation of the possibility of reserving high-grade coal for specific purposes; (3) Early cessation of opencast mining and retention of reserves for emergency; (4) High priority for means of improving fuel utilisation, incentives to industry to instal economising plant, and estab. of a fuel-efficiency organisation; (5) Speeding up of economy measures in nationalised industries; (6) Abandonment of manufacturing processes inimical to fuel economy; (7) Confinement of use of solid fuel, gas, and electricity to purposes for which each is best suited, and a closer integration of gasworks with power stations.

United States of America. The Amer. coal trade was fully estab. in 1820, although the output was not then very large, when the Schuylkill Navigation Co. sent coal down the Lehigh and Delaware R.s. to Philadelphia. Up to the year 1870 the coal output of the U.S.A. was less than that of either Great Britain or Germany. Then, in 1871, the U.S.A. began to pass Germany, and from 1877 onwards completely left Germany behind. Great Britain's output was passed in 1899, and the U.S.A. are now producing nearly one-third of the world's C. S. In 1920 over 587,000,000 long tons were produced, while in 1923 and 1926 the total was 587,000,000 tons in each year, the average for the decade 1920-9 being over 500,000,000 tons. In 1932 the figure dropped to 317,000,000 tons, and in 1933 to 336,000,000 tons. In the same decade exports averaged nearly 28,000,000 tons. Recent export figures have been lower. In 1929 the U.S.A. had 11.7 per cent of world coal exports; in 1936 the proportion was 9.2, as against the U.K.'s 40.1 and 34.9 respectively, and Germany's 19.8 and 26.4. The total area estimated to contain coal-beds is close on 500,000 sq. m., of which about 250,530 contain anthracite and bituminous coal, about 100,000 varying grades of bituminous, cannel, and lignitic coal, and the rest ordinary lignite. In the 1913 estimate for the Geological Congress the original tonnage of all kinds of coal on levels above 3000 ft was reckoned at 3,225,394,300,000 metric tons. The total production of coal to the end of 1910 was 7,480,355,040 metric tons, and an amount equal to half this figure was allowed for waste; it followed that 11,220,532,560 tons out of the original tonnage had been exhausted, leaving a reserve of over 3,200,000,000.

TABLE 1. COAL PRODUCTION IN WESTERN EUROPE, 1954

	1000 metric tons	Output per manshift tons	Number of workers
Belgium	29,429	1.098	147,000
Czechoslovakia	21,500		
France	54,405	1.504	216,000
Saar	16,818	1.744	57,300
W. Germany	128,035	1.492	429,000
Italy	1,074		8,500
Netherlands	12,071	1.497	47,900
Poland	91,300		
Spain	12,429		
U.K.	227,875	1.614	705,000

Germany also produced 87,811,000 tons lignite.

Germany exported (in 1954) 16,711,000 tons, the U.K. 13,918,000 tons, while the U.S.A. exported 9,810,000 tons to W. Europe. Exports from the Saar reached 8,994,000 tons. The following countries imported coal:

France	11,683,000 tons	Denmark	4,470,000 tons
Italy	9,634,000 "	U.K.	3,053,000 "
W. Germany	9,285,000 "	Sweden	3,024,000 "
Netherlands	7,148,000		

TABLE 2. COAL PRODUCTION AND CONSUMPTION IN THE U.K., 1 JANUARY-31 MARCH 1955

	Mined tons	Open- cast	Total	Inland consumption	Shipment overseas
January	4,265,500	142,000	4,408,400	4,787,500	284,500
February	4,358,675	159,000	4,517,675	4,822,000	267,500
March	4,420,860	192,860	4,613,720	4,754,000	274,000

TABLE 3. THE OUTPUT OF COAL IN GREAT BRITAIN, AND THE COAL, COKE, AND PATENT FUEL EXPORTED, IN THE FIVE YEARS PRECEDING THE SECOND WORLD WAR

Year	Coal produced		Coal, coke, etc., exported		Bunkers for Ships in Foreign Trade *
	Tons	Value	Tons	Value	
		£		£	Tons
1934	220,726,000	142,119,000	42,582,000	34,603,000	13,487,000
1935	222,249,000	144,539,000	41,870,000	34,578,000	12,526,000
1936	228,448,000	160,119,000	37,348,000	32,292,000	11,948,000
1937	240,409,000	182,674,000	43,463,000	41,888,000	11,703,000
1938	227,015,000	188,822,000	38,196,000	40,713,000	10,489,000

* Not included in exports.

In 1948, the proved world resources were stated as follows:

	Million tons
Europe	548,000
N. America	42,000
Central and S. America	2,000
Africa	9,000
Asia	11,000
Australasia	4,000
Total	616,000

In 1955 the total world coal production was estimated at 1,501,100,000 metric tons; the chief coal-producing countries in 1955 are given below:

	Thousands of metric tons
U.S.A.	447,577
U.S.S.R.	276,100
U.K.	225,157
Federal Ger. Rep.	131,811
Poland	94,446
China (continental)	93,170
France	55,335
Japan	42,423
India	38,826
Union of S. Africa	32,111
Belgium	29,978
Czechoslovakia	22,100
Australasia	20,399
Saar	17,329
Spain	12,426
Netherlands	11,895
Canada	11,362
Turkey	5,496

See I. Thomas, *Coal in the New Era: Our National Wealth*, 1934; Political and Economic Planning, *The British Coal Industry*, 1936; Imperial Institute, *The Mineral Industry of the British Empire and Foreign Countries: Summary* (ann.), 1938; H. L. Pirie, *British Coal*, 1944; H. Townshend-Rose, *The British Coal Industry*, 1951; W. W. Haynes, *Nationalisation in Practice*, 1953. See also bibliographies for COAL, COALFIELDS, COAL-MINING.

Coal Tar, one of the products obtained by the carbonisation of bituminous coal the others being coal gas or coke oven gas, coke, crude benzole, and ammoniacal liquor. C. T. is condensed with the ammoniacal liquor forming a dark-coloured viscous lower layer. Originally C. T. was an unwanted by-product, although the earliest patent for the destructive distillation of coal, taken out by Becher and Serle in 1681, was for the production of C. T. and pitch. Fortunately the rapid development of the gas industry and the replacement of the old bee-hive coke ovens by by-product ovens coincided with an increasing demand for some of the products of C. T., particularly for creosote for the preservation of railway sleepers and for naphtha as a rubber solvent. The rapidly developing science of organic chem. too, found C. T. a veritable treasure chest of new chemicals which rapidly became the raw materials for synthetic dyestuffs and drugs. Thus C. T. was transformed from an embarrassing waste

product to the valuable by-product it is to-day. In Great Britain the present production of C. T. is close to 3,000,000 tons per year, of which about 42 per cent is derived from gas-works' continuous vertical retorts and about 50 per cent from coke ovens or horizontal retorts. Chemically C. T. is an extremely complex mixture; over 400 individual compounds have so far been identified in or isolated from it. While comparatively little is known of the chemical nature of the components whose molecular weights range from 400 to 2000, the chemical nature of the 70-80 per cent of C. T. whose molecular weight range is from 80 to 400 is now fairly well established. Aromatic hydrocarbons, particularly polynuclear hydrocarbons with or without substituent methyl groups predominate; over 90 per cent of coke oven and horizontal retort tars consist of such components with up to 5 per cent of paraffinic hydrocarbons, a small percentage of hydroxy-aromatic compounds, and smaller amounts of heterocyclic nitrogen, sulphur, and oxygen compounds. C. T. derived from continuous vertical retorts differs in that it may contain 15-25 per cent of paraffins, 20-25 per cent of hydroxy-aromatic compounds (phenols) and of the remaining aromatic hydrocarbons the majority contain one or more methyl or ethyl substituent groups. Commercially the components of C. T. are separated into fractions by distillation. Formerly this process was carried out in batch pot-stills and the fractions—light oil, light creosote or middle oil, heavy creosote or heavy oil—pitch-treated for the recovery of certain major components. Over the past 25 years there has been an increasing tendency to replace pot-stills by large continuous pipe-stills which may process up to 400 tons per day of crude tar, and in 1955 about two-thirds of the C. T. distilled in Britain was processed in continuous plants. These plants give narrower and better designed fractions which leads to an increase in the yield and purity of the separated components. In view of the difference in the chemical nature of the 2 main types of tar, the fractions taken from coke oven tar are different from those taken from continuous vertical retort tar. From these former, light oil (distilling up to 200° C.), naphthalene oil (220-230° C.), wash oil (230-270° C.), anthracene oil (270-330° C.), and heavy oil (330-360° C.) are the main fractions; from the latter the fractions taken are crude benzole (0-15° C.), crude naphtha (150-180° C.), carbolic oil (180-230° C.), wash oil (230-270° C.), and heavy oil (270-360° C.). All the distillates boiling up to 200° C. are refined and redistilled to give benzole, toluene, xyloles, and naphthas which supply the chemical industries with the benzene, toluene, xylenes, etc., used as starting materials for a vast range of intermediates for the synthesis of dyestuffs, pharmaceuticals, explosives, plastics, etc. Naphthalene is extracted from the naphthalene and carbolic oils, and from the latter come phenol, creosols, and xylenols. The main use for naphthalene is for the production

of phthalic anhydride, while the phenol, cresols, and xyenols are extensively used for the production of thermosetting resins, bactericides, anti-oxidants, etc. The other major by-product is anthracene, used for the production of dyestuff intermediates; it is derived from the anthracene oil fraction. However, the separated chemicals from C. T. amount to only 10-15 per cent of the crude tar. Pitch (q.v.), the residue left on distillation, represents 50-65 per cent, and the remaining 25-35 per cent consists of creosote, a mixture of oil from which the by-products have been removed. C. T. pitch is used extensively as a binding agent for coal



Fox Photos

LEICESTERSHIRE MINERS ON THEIR WAY TO PIT-HEAD BATHS

briquettes and carbon electrodes, and either alone or mixed with creosote as a liquid fuel. Large amounts of pitch fluxed back with creosote oils are used as road tar and as an anti-corrosion protective coating for steel and concrete pipes and structural steel work. Creosote is the most extensively used material for preserving wood against attack by fungi and insects; other uses include the production of motor spirit by hydrogenation (about 150,000 tons per year), as a disinfectant, and as a solvent for extracting benzole from coal gas. The yield of crude C. T. from continuous vertical retorts is approximately 7.5 per cent by weight and from coke ovens and horizontal retorts about 5 per cent by weight. See articles on the various substances mentioned above. See also C. Lunge, *Coal Tar and Ammonia*, 1916; A. R. Warner, *Coal Tar Distillation*, 1923; Winkler, *Der Steinkohlenteer*, 1951.

Coal Trade. Various laws have been passed regulating the C. T. From very early times the Corporation of London used to weigh or measure all coal brought into the port, while the mayor and aldermen of London and the justices of the

cos. could also, by virtue of Acts of Parliament dating back to Edward VI's reign, fix the retail price of coal. Further, general taxes have been levied on coal at different times. At one time the Corporation of London could exact these dues. In 1667 they were exacted to aid in repairing the damage done by the Great Fire, and they were continued till 1889, and the proceeds used for civic improvements. In William III's reign a tax was levied on sea-borne coal. This tax was abolished for a short time in 1830, re-exacted in 1842, and dropped in 1845. From 1901 to 1906 there was a tax of one shilling levied on every ton of coal exported from this country. Up to 1913 the C. T. prospered under individualistic control, and immediately after the First World War the coal industry was in better working condition in England than in the rest of Europe. In 1921 came a depression with a mining stoppage of 3 months. The C. T. improved in 1922, until in 1924 foreign competition began to have its effect, and in 1925, 500 of the Brit. mines were closed. A stoppage of 7 months followed in 1926, during which year the U.S.A. nearly doubled their exports and a great stimulus was given to the European C. T., especially in Poland. In 1928 the Yorks and Midland coal-fields were combined under the Central Collieries Commercial Association (C.C.C.A.), based on the Rhenish-Westphalian Syndicate, which after 1893 had rationalised the Ger. C. T. with marked success. The C.C.C.A. and similar marketing schemes in Scotland and S. Wales regulated the output and stabilised the prices of over 60 per cent of the national production. These schemes were an attempt to overcome the inter-colliery competition, due to the individualistic traditions of the coal-owners, and to eliminate the profits of the middleman, thus paving the way towards a national selling organisation for the export trade. (See COAL MINES, NATIONALISATION OF.) Increase of production of Amer. coal, and consequently of Amer. C. T., is due to technical administration and a high standard of output due to machine-cutting. Output per man rose from 3.73 tons in 1913 to 4.78 tons in 1927. An important factor in production, too, has been the increasing regard to the welfare of the miner, evidenced in the provision widely of pit-head baths, canteens, private bus services, and housing schemes. Under a scheme announced in June 1948, univ. scholarships are awarded by the National Coal Board to selected pit workers to enable them to qualify in mining engineering and allied subjects. Statistics of Brit. and Amer. export trade are given under COAL SUPPLIES. See also I. C. Smart, *The Economics of the Coal Industry*, 1930.

Coalbrookdale, vil. of Shropshire, England, on the banks of the Severn, 11 m. from Shrewsbury, and forming part of the bor. of Wenlock. C. has an iron industry, founded in 1740, with the distinction of making the first iron bridge. Pop. 2000.

Coaling Stations, see BUNKERING STATIONS.

Coalition, combination of states or political parties having different or opposed interests, effected for the purpose of attaining a specific end or carrying out or resisting a particular policy. Some international C.s were the first C. against France in 1793, formed by England, Spain, Holland, Austria, and Prussia; the second C. against France in 1798 after the battle of the Nile; and the third C., of which the chief members were England, Austria, and Russia, formed in 1805, largely through the exertions of Pitt. One of the most famous C.s of political parties in past Eng. hist. was the C. ministry of 1783, with the Duke of Portland as nominal Prime Minister, the two antagonists Fox and North being the secretaries of state, following on the C. of Fox and Burke in 1782 to turn Shelburne out of office, both C.s arising out of the bitterness and personal recriminations engendered by the loss of the Amer. colonies. In 1804 Pitt, Fox, and Grenville united to oppose the Addington ministry, but on Pitt becoming Prime Minister the C. broke up because the king refused to receive Fox. The object of this last C., which sank the differences of its members over the question of Catholic emancipation, was to secure a stronger ministry in view of the general menace to Europe from France under Bonaparte. Most C.s between parties either break up at once or become permanent through the absorption of one party by the other. The latter happened in the case of the Liberal and Conservative C. against Gladstone's Home Rule Bill of 1893. Another important Eng. political C. was that of the Liberal, Nationalist, and Labour parties after the general election of 1910, the dominant motive of which was the determination to give Home Rule to Ireland. The necessity, on the outbreak of the First World War, of sinking party politics in the larger issues led in Great Britain to the formation of a C. Gov., representative of all shades of political opinion, and during the Second World War a C. gov. existed in Britain, under Churchill, from May 1940 until June 1945. The 'National' Gov. of 1931 was also essentially a C. Gov. of the Conservative party together with such of the representatives of the Liberal and Labour parties as were opposed to the previous Socialist regime. Its formation, however, soon estranged the bulk of the Labour and orthodox Liberal parties.

Coalville, tn and dist. of Leics, England, 5 m. from Ashby-de-la-Zouch and 12 m. from Leicester. Coal-mines are in the dist. Pop. 25,630.

Coanza, see QUANZA.

Coast (Lat. *costa*, a rib), border of the land as it meets the sea, forming a shore line of more or less irregularity of contour, according to the various causes which have been at work. Though the sea-C. is generally meant when the word C. is used, it is also applied to the shores of large rivers or lakes. Many elements combine in producing the various types and varieties of C., of which the broad outlines may be described, though, of course, no 2 C.s are exactly alike in

detail. The chief agents in the sculpture and formation of the C. are the currents of the sea and the erosion caused by the waves; these agents have to work on widely different kinds of material, as some C.s are of hard rock, others of sand, and others again of heterogeneous rocks. It is estimated that nine-tenths of the world's coastline is fringed with sand. The waves formed by the winds run ashore and beat upon the land, the C. of which is gradually worn away by this unrelenting but unrelenting attack; the land which is washed away is carried into deeper water, and so the area of the land is reduced. The character of the C. has a great effect on both the coastwise trade and the international trade of a country; for neither form of commerce can attain great proportions unless there is a sufficiency of safe harbours for the vessels engaged in it. Shore-lines in an immature form, that is to say, before they are changed by the action of the sea, may be divided into 2 main categories. The first class is that produced by the land having been raised, the second where it has been lowered. Where the sea lies on an uplifted bottom, the shore-line will be of an unbroken and simple character, and will be bordered by shallow water. The shore-line will be of a broken and more complicated nature, and bordered by deeper water, where the sea lies on a depressed land surface. Shore-lines belonging to the first category are generally deficient in harbours, and traffic between land and sea is by no means easy. As an example the C.-line of Buenos Aires may be cited; the waters are shallow for a long distance from the shore-line, and artificial harbours have to be dredged before vessels of any size can approach close to the land. The shore-lines of the second class are, as a rule, well supplied with harbours situated in sheltered bays. An irregular C. is favourable to the development of the maritime arts and to the breeding of expert sailors and fishermen; among examples of shores of this class may be mentioned those of Patagonia and Norway. If the C.-line runs parallel to a mt range it is, as a rule, of a more regular character than when it crosses the folds of the range. A recently elevated C. is more irregular in outline than one which has been exposed to the action of the waves for a long time. The irregularities which were impressed upon the surface of a recently depressed C. before submergence took place will be traceable in the C.-line. If a C. is composed of homogeneous rock, and the action of the waves is similar along its extent, the outline formed will be regular; if, however, the rocks composing the C. are of varying degrees of hardness, bays and inlets will be eaten out of the softer rocks, and headlands, etc., will be formed of the harder rocks. The same results will be obtained if the rocks of the C. are homogeneous, but the action of the waves varies, as where the waves are more violent bays will be formed. In shores of the first class, the waves of the sea, especially in stormy weather, beat up the

sands of the bottom, and in course of time build sand-reefs off the shore. These reefs enclose long, narrow lagoons; the finer particles which compose them are swept away, but the reef is not destroyed thereby, for the loss occasioned is repaired by the sand which is brought in from the sea bottom. The ebb and flow of the tides and the action of the riva. preserve inlets through the reefs; the number and size of these inlets are, of course, regulated by the strength of the tides. The depth and even the outline of the channels on C.s of this nature may be changed so rapidly by the action of tidal currents that charts are unreliable, and local pilots must be employed by the captains of vessels. Tidal deltas are also formed by the action of the tides, and their outer edge often forms a bar which is only navigable at high tide. When the sand is brought to a reef in greater quantities than it is carried away, the reef advances into the sea, and may be a mile or more wide; at Atlantic City, in New Jersey, U.S.A., the reef is gaining on the sea in this manner. If, on the other hand, more sand is carried away than is gained, the reef gradually becomes smaller, and at length disappears, when the mainland is once more exposed directly to the action of the sea; the low C. of the middle Netherlands has thus retreated. It is of rare occurrence for coastal plains to end in cliffs which are at a great height above the sea. Such a phenomenon would be of comparatively frequent occurrence if the action of the sea on a coastal plain were uninterrupted for a long time; it is therefore inferred that such a development is generally interrupted by either a subsidence or an upheaval of the land. The best example of the results of such an uninterrupted development may be seen in the coastal cliffs of Normandy in France. The progress of formation of C.-lines of the regular first class is often interrupted by depression of the land. The C. is then changed into one of the second class, though the bays and headlands will not be of extraordinary magnitude. In the same way, the land may be elevated and interrupt the C. formation, but in such cases the effects are not so easily visible. The former C.-line will be marked by low sand dunes and ridges, if no very advanced stage of development had been reached before the upheaval, or by higher terraces and bluffs, the height of which will vary according to the progress made. The coastal plain of Mexico, for example, is marked by several terrace-like benches or steps; it is inferred from this that the elevation of the country took place gradually, thus giving time for the effects of the action of the sea between each upheaval to be perceptible. When an uneven land surface is partly submerged, the valleys become bays and the hills is. The forms of the land present more variety than those of the sea bottom, and hence shores of the second class are more varied in outline. The sea's action will be greatest on the projecting headlands and outlying is. The rock fragments weathered from the C., after being

rounded by the action of the waves, grind the rocks at their base and cut a notch in the edge of the land. The base of the cliff thus attacked is eroded by the dashing of the waves, great masses of rock fall, and the shore is gradually worn away. Isolated rocks, 'needles,' and columns are often left off the shore in such cases; the 'Old Man of Hoy,' off the N. of Scotland, is an example. If a shore-line of the second class suffers a further depression, the sea will begin its action on the cliffs in much the same way as before; the lines of the C. will naturally be altered, and the former is. will in many cases be submerged. When an upheaval takes place, the former C.-line may be traced at some distance from the new one; the cliffs and beaches which composed it are distinct at first, but in course of time are affected by the weather, and become merged in the general character of the land. Along the W. C. of Scotland there are evidences that the land has been uplifted for 20 or 25 ft; the cliffs of it stretch inland, and the former C.-line was more advanced in character than most of the present C. The bays of the former shore-line, when elevated, form coastal plains lying between rugged headlands; such formations form most beautiful scenery, and abound along the shores of Italy. The W. C. of Norway now stands some hundreds of feet higher than in former times, as is evidenced by the platform or bench of low land which borders the mts which formed the ancient sea cliff. From the fjord and its configuration of the C., it is probable that after the platform mentioned above had been cut, the land was raised even higher than it now is, and was eroded by glaciers. A depression then took place which drowned the valleys and created the present multiplicity of is. Where one part of the cliff is weaker or composed of softer rocks than the rest, the waves in time excavate a cave; among the numerous examples of such, Fingal's Cave on the is. of Staffa, Scotland, and many caves on the C. of Maine, U.S.A., may be mentioned. Shore-lines are affected by climate and temp. as much as the land. In Arctic climates the land is bordered by a fringe of ice, known as the 'ice foot.' In the equatorial and warm seas certain kinds of trees grow on the shores and impede landing; of these the most important is the mangrove-tree. Coral reefs also are found in these waters (for their formation and action, see ATOLL; CORAL; GREAT BARRIER REEF, etc.). The waves and currents of lakes are not so violent as those of the open sea, but the C.s of lakes exhibit many features analogous to those of sea-C.s. The S. shore of Lake Erie, for instance, has been washed away so as to develop low cliffs of a fairly even front for many m. When lakes are formed at the back of barriers of glacial drift, their waters may rise upon a land surface of much irregularity, and the C.s of the lake thus be of very varied character. Lake Lucerne, Lake of the Woods, and Lake Superior are examples of irregular lakes. The indication and measurement of C.-lines vary on maps according to the scale

thereof, as it is, of course, impossible to show as much detail on a small-scale map as on a large one. When the scale is very large 2 C.-lines will be shown, the one showing the position at high-water, the other at low-water mark. The measurement of the C.-line may be a matter of some difficulty, as if all irregularities possible are included, the length is of necessity greater. There are 2 methods of measuring: the first way is simply from point to point of the headlands of the C. The other way is to include every bay and inlet, and to measure up every riv. to the point where the action of the tide ceases. The ratio between these measurements is an indication of the coastal development of the country measured. See R. R. Minikin, *Coast Erosion and Protection*, 1952, and J. A. Steers, *The Sea Coast*, 1953.

Coast Defence. Elaborate systems of C. D. formed part of the military organisation of maritime nations until comparatively recent years. These included fortifications equipped with heavy artillery, special naval forces detached for the purpose (torpedo-boats, etc.), and C. D. troops. The advent of the guided missile has rendered most of those arrangements obsolete. The Brit. Coastal Artillery was disbanded in 1956 and similar action is being taken in other countries.

During the First World War, the greatest attack on C. D.s was that at the entrance of the Dardanelles (q.v.) in 1915, when the allied fleets of Great Britain and France attacked the Turkish fortresses. The attack was carried on intermittently for about a month, but the fleets lost so heavily that it was decided to await the land attack. The combined attacks by land and sea failed to reduce the Turkish defences and the allied forces withdrew from the Gallipoli peninsula (q.v.). It was expected in this war that the extensive use of aircraft and submarines would change the character of C. D.s, but it was found that the counter-measures neutralised any forms of attack from these new machines of war. In the Second World War coastal anti-aircraft guns were far more powerful than in the First World War and were far more numerous. Moreover, fighter planes had to be regarded as an essential factor in C. D. (See also COASTAL COMMAND for measures taken to protect coastal and other convoys.) Shore defences were more elaborate than in the First World War. In anticipation of a possible Ger. invasion cement blocks of anti-tank obstructions were sown thickly along the coast wherever a landing might seem to be practicable, and formidable iron and wire barriers were erected in the sea a short distance off-shore. Further, mine-laying was much extended so as to render approach by enemy surface or other sea craft both difficult and hazardous. See ARTILLERY; FORTIFICATION; MINES, MILITARY AND NAVAL; TORPEDO.

Coast Erosion, see COAST PROTECTION AND EROSION.

Coast Protection, result aimed at by the various devices which are adopted for

the protection of the land from erosion, damage by waves, etc. The main object in the reclamation of land is the increase of cultivable ground; it is principally in connection with such reclaimed land that protective works are necessary, though in many cases they are adopted rather to prevent the encroachment of the sea than to retain land already won. There are 2 prin. kinds of protective works, sea-walls or banks, and groynes. There are 3 main kinds of wall, those with very sloping batter, vertical, or stepped batter. The best form appears to be a wall with an almost vertical face, or alternatively slightly stepped. The vertical face resists the action of the waves most, and is thus opposed to more force, but it also breaks the recoil; a wall with a face sloping inward has not so much resistance to meet at the first onslaught of the waves, but by its form it accentuates the recoil; a stepped wall breaks the force of both the waves and the recoil. In the case of the 2 former kinds of wall, they are particularly liable to be undermined by the action of the waves, and should be protected at the foot by an 'apron.' If the foreshore consists of hard rock this is not so necessary, as the shore itself fulfils the function. Generally speaking, however, sea-walls are not satisfactory, regarded as the sole means of protection for the coast, and must generally be supplemented with groynes. Walls are very costly, and although they may seem at first to resist the erosive action of the sea, in reality they increase it.

The other form of C. P., that afforded by the construction of groynes, is on a different principle. Groynes promote the natural accretion of detritus or eroded material on a beach by the construction of artificial shelter. The littoral drift of sand down a beach may be intercepted by means of groynes projecting from the beach line, and so accretion of sand may take the place of erosion. This is, of course, the ideal result of groynes, but there are sev. difficulties and disadvantages to be overcome. The building of groynes has, in fact, been a matter of trial and error. Erosion produces a littoral drift, and much of the drifted material is of necessity carried out and deposited in deep water. If high groynes are used, the 2 sides of the groyne will not receive the detritus equally, and one side will be denuded; this difficulty is found at Dungeness, Cromer, and Hastings, for example. The general effect of groynes is to render the adjacent portion, not so protected, more liable to the eroding influence of the waves. The distance to which groynes can be carried out to sea determines their efficacy in collecting drift: they should always reach low-water mark. The beach of any shore which is composed of movable material should gradually slope up to high-water mark in the form of an ellipse; the sea will then not do much damage but roll in and out without erosion. This result is attained by raising the groynes slightly above the beach and promoting the accumulation of drift to leeward, as the scour of the

waves is lessened and the passage of the detritus over the obstacle facilitated. As the drift accumulates the groynes should be gradually raised, if necessary, and extended. The direction of the wind controls the travel of the drift, as the latter veers with the wind. In England there are examples of groynes of every design, laid out at every sort of angle. They used to be laid out at right angles, but no rule can be applied to a varying coastline, for the groyne should be designed to meet squarely the waves driven by the prevailing winds. The proof of good design in



LOWER CLIFF WALK, BRIGHTON
Promenade on sea-wall, and stone and wooden groyneage.

groyneage is that the accumulation either side of the groyne should be equal. Where a coast is fringed with sand dunes, the beach should be protected from erosion by a regular series of groynes; the dunes and the promenade then receive sufficient protection by a simple sloping wall, with a maximum inclination of 2 to 1. Bridlington beach is protected by groynes, with very good results, as are the sandbanks at Poole harbour. Among other places at which groynes have been instrumental in improving the condition of the beach may be mentioned Sheringham, Weymouth, Cromer, Eastbourne, Dymchurch, and Deal. A more detailed account of the groynes at Bridlington will serve to show the results in this particular case, and the general principles acted upon. The Bridlington beach, which rests upon boulder clay, was rapidly being lessened as the result of increased erosion due to the erection of sea-walls. Groynes consisting of piles with dimensions of

14 ft by 9 in. by 9 in., made of pitch-pine, and 11-in.-by-4-in. planks were erected along the seashore. To obviate the denudation of the sand to leeward, the planking was at no time raised more than 2 strakes above sea level, but fresh planks were added as necessary. The prevailing gales in the winter are S.E., and hence the groynes were slanted 10° S. of E. from the perpendicular. The cost of this operation was between 12s. 3d. and 18s. per lineal ft. and very good results were obtained. In Poole harbour the groynes were built at varying angles, and there is no doubt that if it had not been for these preventive measures the harbour would have been silted up. The timber groynes which were built on the beach between Lancing and Shoreham had the effect, in the course of a few years, of causing the high-water mark to recede 85 ft. Low wooden groyneage has been used for the preservation of Romney Marsh. It was inexpensive and has proved successful. At Blankenbergh, groynes were constructed which had an excellent effect in checking the eroding action of the R. Scheldt. They were 820 ft long, and at intervals of 680 ft; they extended to below low-water mark, and were at right angles to the beach. In order to facilitate the even distribution of drift over the whole area to be protected, and to lessen the erosion from wave action, the groynes were raised only slightly above the beach. They were built with wide tops and had a foundation of fascines and concrete, faced with brickwork or stone pitching. The result was to form a practically ideal sloping beach (cf. *supra*), on which wave action was reduced to a minimum. This type of groyne is, however, too expensive for general use. The extension of groynes below low-water mark is advocated by some engineers, and as submerged wood, even when treated by a crosoting process, is always liable to be attacked by such enemies as the teredo, concrete and other similar materials have been suggested for groynes. Experience alone will prove which is the best material. For C. P. in Holland sea-walls or dikes are used in addition to groynes, and for the protection of submerged banks fascine mattresses. The latter are made of willow brushwood and are ballasted with stone. The Zuider Zee has now been enclosed and partly reclaimed. The prin. method of construction for the enclosing dike is an exterior dam of boulder clay, and behind this sand covered with a layer of clay, having a facing of stone on both sides.

Another important feature of C. P. is dune fixation. The importance of this is recognised in the U.S.A., and grass is generally planted. In England marram grass has been used successfully, notably on the Norfolk coast, and on shingle beaches for protection against on-shore gales tamarisk is recommended.

Under the Coast Protection Bill (introduced in 1948), amending the law on C. P. against erosion, the council of each maritime co., bor., or co. dist. becomes the protection authority. Orders may be made for setting up C. P. Boards, which

will be empowered to raise money for protection work and to hold land. Development of land will not be allowed unless the protection authority certifies that it is consistent with C. P. See W. H. Wheeler, *History of the Fens*, 1897, and *The Sea Coast*, 1902; F. M. du Plat Taylor, *The Reclamation of Land from the Sea*, 1931; E. R. Matthews, *Coast Erosion and Protection*, 1934; R. R. Minikin, *Coast Erosion and Protection*, 1952.

Coast Ranges, system of mts in N. America extending along Brit. Columbia, Washington, Oregon, California, Lower California, and Mexico, almost parallel to the Pacific coast. These mts are very irregular, sometimes attaining to a great height and then remaining at a comparatively low one for a considerable distance. The character of the scenery is also very varied, the mts in some places being almost bare, and in other places being densely covered with thick forests. In Brit. Columbia the Coast Range, called also Cascade Range, averages a height of 6000-7000 ft., although some peaks attain a height of 9000 ft. Many of the trees on the slopes of the C. R. grow to an enormous height, of which the Douglas spruce is an excellent example, being 250-300 ft high. In Washington the mts are called the Olympic group and are very rugged, the highest peak, Olympus, being 7954 ft high. The mt range diminishes in size in Oregon, averaging between 1000 and 5000 ft in most parts. In California the C. R. present an insignificant appearance for about 400 m. Further on, nearer San Francisco, they attain to a great height in some peaks, whilst not far from Los Angeles San Bernardino Mt rises 10,630 ft high, and Mt San Geronimo 11,485 ft.

Coastal Command, development of 'Coastal Area, R.A.F.', which was formed towards the end of the First World War to develop, in relationship with the Admiralty, all aspects of air co-operation in war at sea, to administer and train the Fleet Air Arm on land, and to develop flying-boats for the defence of trade and imperial communications. In 1937 the administration of the Fleet Air Arm was transferred from the C. C. to the Admiralty. That the work of the C. C. airmen in the Second World War was of the highest importance might be inferred from the fact that their patrols for the protection of ocean convoys covered more than half the seas from the Arctic to the Equator, and from the Bay of Biscay to the Amer. shores, throughout the duration of the battle of the Atlantic. It was owing to spotting by their craft of the *Bismarck* (q.v.) weighing anchor for her first and final sortie that she was so soon sunk. From the outset the command joined with the navy in attacking the U-boat wherever and whenever it was located. By the end of the war C. C. squadrons had destroyed and shared in the destruction of 212 enemy submarines. The prison-ship *Almark* (see NAVAL OPERATIONS IN SECOND WORLD WAR) was discovered in Josing Fiord by C. C. reconnaissance. Frequently U-boat crews surfaced and surrendered to C. C. aircraft. With mine,

bomb, and torpedo C. C. maintained throughout the war an unrelenting offensive against the enemy's shipping along the coasts of Europe, and thus imposed an ever-increasing strain upon his land communications. See H.M.S.O., *Coastal Command*, 1942.

Coastguard. The modern C. service has developed from a preventive service of the 16th cent. It was under the control of the Customs until 1856, when it was transferred for administrative purposes to the Admiralty. By the Coastguard Act, 1925, the control of the C. service passed to the Board of Trade Marine Dept. The service is now under the control of the Ministry of Transport and Civil Aviation, although for a time during the Second World War it was again administered by the Admiralty. The coasts of the U.K. are organised into 10 divs. i.e. N. Scotland, E. Scotland, N.E., E., S.E., S., S.W., Cambrian, N.W. and N. Ireland. The divs., each under an inspector, are subdivided into 31 dists., each under a dist. officer. There are 155 regular C. stations and 153 auxiliary stations (manned by Coast Life Saving Corps); regular stations are in the charge of a station officer or coastguardman-in-charge. There are over 530 regular C. staff, and the Coast Life Saving Corps has some 6400 voluntary members. The regular C.s are generally men who have seen active naval service. The C. is concerned with marine casualties of all kinds and is based on a watch from coastal look-out huts, in most places set only during periods of bad weather. In 1927 it became largely a life-saving service with very much reduced numbers. In the U.S.A. a C. service was created by an Act of Congress in 1915, absorbing the previous duties of the revenue cutter and the life-saving services. This service is responsible for maintaining the N. Atlantic International Ice Patrol. See also SIGNALS.

Coasting Trade, shipping trade carried on between ports of the same country. The different coasting areas of the world have produced coasting ships (coasters) of many markedly different types evolved to suit local conditions. In the U.K. participation in the C. T. was formerly reserved to Brit. ships, but since 1854 the trade has been open to foreign shipping; even so Brit. ships accounted for 93.9 per cent (51,525,000 tons net) of the movement of shipping in the U.K. general C. T. in 1956; for comparison it may be mentioned that the total *foreign trade* movement of shipping at U.K. ports in 1956 was 127,054,000 tons net. Coastal shipping forms an integral part of Britain's transport system as a whole, the tonnage of the goods carried having been estimated as more than a third of that carried by rail. The prin. cargo carried is coal (28,800,000 tons in 1956); other items are cement, minerals (especially sand, chalk, slate, stone, ore, scrap iron, china clay, and fertilisers), food (especially grain and potatoes), timber, and wool and cotton.

There are 5 prin. classes of vessel engaged in the Brit. C. T.: liners (i.e. vessels running in a scheduled service);

large tramps (over 1000 tons gross); small tramps (under 1000 tons gross); tankers (which with the advent of the giant deep-sea tanker may come to be increasingly important as a means of local distribution); and estuarial craft. The types of vessel falling into these prin. classes are too numerous to enlarge upon, but one highly specialised craft that many must have seen passing under London's bridges with lowered funnel and mast is the 'flat-iron' collier, which keeps the Thames-side power stations supplied with coal. Machinery aft is a frequent characteristic of the coaster; so too is the raised quarter-deck.

The table below shows the movement of shipping with cargo in the general C. T. of the U.K. (excluding the Rep. of Ireland) in 1938, 1947, and 1956 (figures in thousands of tons net):

	British	Foreign
	1938	
Arrivals	21,310	332
Departures	21,452	346
Total	42,762	678
	1947	
Arrivals	19,755	484
Departures	19,716	514
Total	39,471	998
	1956	
Arrivals	26,159	1685
Departures	25,366	1634
Total	51,525	3319

See P. Ford and J. A. Bound, *Coastwise Shipping and the Small Port*, 1951.

Coat of Arms, see ARMS, COATS OF and HERALDRY.

Coatbridge, burgh of Lanarkshire, Scotland, 9 m. E. of Glasgow, and one of the 11 vills. in the par. of Old Monkland. It became a municipal bor., with the privileges of a royal burgh, in 1885. C. lies in the centre of a mineral dist., and possesses in addition to sev. churches a technical school, various municipal buildings, and 4 fine parks. There is an important iron and steel industry. Pop. 43,000.

Coatepec, tn in the Atlantic state of Veracruz, Mexico, 56 m. distant from Veracruz city, an agric. centre with sugar and coffee industries and alcohol distilling, and famous for orchids. Pop. 11,460.

Coates, Albert (1882-1953), musical conductor, b. St Petersburg of wholly Eng. parentage. Educ. at Buckhurst Hill School, and studied science at Liverpool under Sir Oliver Lodge. Returned to Russia. Entered Leipzig Conservatorium; joined Nikisch's conducting class. Conducted the Opera at St Petersburg for 5 years. Came to England in 1919, conductor to Sir Thomas Beecham at Covent Garden. Conductor of London Symphony Orchestra and Royal Philharmonic Society. Director, Philharmonic Orchestra, Rochester, New York, 1923 to 1925,

when he returned to England. His last years were spent in S. Africa. Operas: *Samuel Pepys*, 1929, and *Pickwick*, 1936.

Coates, Eric (1886-1957), composer, b. Hucknall, Notts. He won a scholarship at the Royal Academy of Music in 1906. For some years after 1912 he was prin. viola at Queen's Hall. His compositions include chamber music and many light orchestral pieces, songs, and marches.

Coates, John (1865-1941), tenor singer, b. near Bradford; began his music as a choirboy. When his voice broke he was trained as a baritone, but after a career in light opera in England and America he achieved a reputation as a tenor by rendering Sullivan's setting of Kipling's *Absent-minded Beggar* in 1899. His chance came at Worcester 3 years later, and henceforward the prov. festivals sought him for leading parts, especially in

modern oratorio. He made his first appearance in London in 1894 at the Savoy Theatre, and eventually, in 1901, took part in the Covent Garden opera. His name is inseparably linked with Elgar's *The Dream of Gerontius*, the occasion of his first singing the name-part at the Worcester Festival in 1902 being the real launching of Elgar's masterpiece on its career of wide popularity in England. C. sang in different parts of Germany and the U.S.A.

Coates, Joseph Gordon (1878-1943), New Zealand statesman, b. Matakohe, son of Edward C. farmer. Educ. privately. Became M.P. for Kaipara, 1911. Served with infantry in France, Jan. 1917 till Feb. 1919. Attained rank of major and received Military Cross. On return home took office under premier Massey; filled offices of postmaster-general and minister of public works. Became first New Zealand-born Prime Minister on death of Massey, 1925. His Reform party was defeated at the general election of 1928, and he was succeeded by Sir Joseph Ward, leader of the new United party. Held various offices in the Coalition Gov., 1931-5, and d. in office during the Second World War.

Coatesville, city in Chester co., Pennsylvania, U.S.A., 34 m. W. of Philadelphia. It is situated on Brandywine Creek. Its chief manufs. are paper, steel

plate, boilers, textiles, and metal products. Pop. 13,826.

Coati, or **Coati-mundi** (*Nasua*), genus of Procyonidae, related to the racoon. They are indigenous to central and S. America, are gregarious and arboreal; the nose forms a mobile proboscis useful in digging up its food.

Coats, James (1774-1857), founder of a cotton-thread business in Paisley, which is now known as J. and P. Coats Ltd.

Coats, Sir Peter (1808-90), and **Thomas** (1809-83), sons of James C., b. Paisley, both Scottish thread manufacturers. Both gave generously to many philanthropic schemes, and Paisley owes much to them.

Coats Land, region of Antarctica, skirting Weddell Sea. It was discovered by W. S. Bruce (q.v.), and named after the brothers Coats in 1904, during the Scottish National Antarctic Expedition. It is included in the Falkland Is. Dependencies sector of the Antarctic.

Coatzacoalcas: 1. Riv. in Mexico which rises in the Sierra Madre, Tehuantepec isthmus, and ultimately falls into Campeche Bay. It is 175 m. long, and navigable for about 125 m. from its mouth. Ocean-going vessels go 24 m. up to the great oil refinery of Minatitlán.

2. (formerly called **Puerto Mexico**). Port in Veracruz, Mexico, on the Gulf of Campeche; N. terminus of the Tehuantepec railway and road across the isthmus, standing 1 m. from the mouth of the wide and 50-ft-deep C. R. The climate is hot. Two converging jetties about 4333 ft long extend from the mouth of the riv. to the sea to prevent the formation of a bar. Its wharves are equipped with all modern equipment. Exports are hardwood, petroleum products, sulphur, cereals, and fruit. The beach is the main street. Pop. 13,740.

Cob, see **HORSE**.

Cob-nut, **Filbert**, and **Hazel-nut** are all names of the fruits of various species of the cultivated hazel (*Corylus*), the parent form of which is *C. avellana*. The 3 fruits differ chiefly in the length of the husks or involucre, which in filberts (q.v.) are longer than the nuts, about equal in cobs, and shorter in hazels. The fruits are edible and are largely cultivated as dessert fruits. *C. maxima* is the Kentish cob or great cob, also known as Lambert's filbert. It has a large thick-shelled nut, the kernel of which is covered by a reddish coat. Barcelona nut is sometimes mentioned as a kind of cob or as a variety of Kentish cob.

Cobalt, in Ontario, Canada, 330 m. N. of Toronto, named from the abundant supply of cobalt ore. Nearly 300,000 oz. of silver were produced in 1903-18, but much less later. The first valuable discovery of ore was made in 1903. Pop. 2407.

Cobalt and Cobalt Ores. Cobalt (symbol Co, atomic weight 59.0) is a metal of the iron group of elements. It is a hard white metal with a bluish cast resembling nickel, produced by the reduction of its oxide or chloride by hydrogen or carbon. Like iron and nickel it is magnetic, although to a lesser degree. The element

is remarkable for the brilliant colours of some of its compounds. Thus a blue colour is imparted to potash glass by the addition of a little C. salt, when C. silicate is formed. C. is a relatively rare metal, but plenty of it is found mined with the silver ores in Ontario around Cobalt City. The chief ores are C. glance (CoAsS), the arsenide-and-sulphide; smaltite (CoAs₂), the arsenide; and C. bloom, which is an arsenate of the metal. These are converted into oxide by roasting and reduced with carbon. The metal itself is becoming increasingly important as a constituent of various alloys, while its compounds are used in the manuf. of paints (both as pigments and as driers). C. chloride gives a pink solution in water, which forms a favourite invisible ink; writing done with this liquid is invisible—more or less—when dry, but goes brilliantly blue on warming. The incorporation of C. salts in silica gel (drying agent) is based on this colour change.

Cobán, commercial and agric. tn, cap. of Alta Verapaz dept, N. Central Guatemala. It is situated at 4331 ft in the finest coffee-growing dist. of the rep. There are textile, net and rope making, and other industries. The nearby underground Lanquin caves and riv. are noted for their blind white fish. Famous also for Maya ruins in the forest. Pop. 6860.

Cobb, Irvin Shrewsbury (1876-1944), Amer. journalist and author, b. Paducah, Kentucky. He held various positions as reporter and on editorial desks at Paducah, Louisville, and New York, and then became a regular staff contributor to various Amer. magazines, specialising in the short story, of which he is considered one of the best modern exponents, particularly of the story in a humorous vein. Many of his stories deal with his native Kentucky, of which he has made himself a sort of prose laureate. Among his best-known books are *Old Judge Priest*, 1915, and *Red Ticker*, 1929. *Exit Laughing*, 1941, is autobiographical.

Cobb, John Rhodes (1899-1952), racing motorist, b. Esher, Surrey, and educ. at Eton and Trinity Hall, Cambridge. He began his racing career at Brooklands in the early 1920's. In 1938 he broke the world land speed record, beating George Eyston's 345.49 m.p.h. with a speed of 350.20 m.p.h.; but Eyston afterwards achieved a new record speed of 357.52 m.p.h. The following year C. raised the record to 369.7 m.p.h.; and in 1947 raised it again to 394.2 m.p.h. He was the first man to exceed 400 m.p.h. on land, having reached 403.135 m.p.h. in one direction. He was killed while attempting to break the world's water speed record on Loch Ness—his first attempt at speed on water.

Cobbe, Frances Power (1822-1904), writer and social investigator. She was a staunch supporter of women's suffrage and the founder of the National Anti-Vivisection Society, and of the Brit. Union for the Abolition of Vivisection. Pub. *An Essay on Intuitive Morals*, 1855, *The Duties of Women*, 1881, and *The Scientific Spirit of the Age*, 1888.

Cobbett, William (1763-1835), author and politician, b. Farnham, Surrey, and worked on his father's farm as a boy, but at the age of 20 became a solicitor's clerk. Finding the life uncongenial, he enlisted and went with the 54th Regiment to New Brunswick. He was soon promoted to the rank of sergeant-major, and secured his discharge in 1791. After a brief stay in France he went to the U.S.A., where he found full play for his talents as a pamphleteer. He became well known, and his fame spread to England, where many of his writings were reprinted. His hatred of shams and dishonesty eventually made him the defendant in a libel action, which, being decided against him, ruined him. He returned to England in 1800, and was taken up by the Tory leaders, Wyndham and Dr Lawrence providing him with funds to start the *Political Register* in 1802, which was pub. weekly until his death. His industry, as he was never tired of pointing out, was prodigious, and his output enormous. Besides writing the greater part of the *Register*, he was the author of many books, mostly of a utilitarian nature, such as *Cobbett's Cottage Economy*, 1822, and *The English Gardener*, 1829. His most characteristic book is *Advice to Young Men*, 1830; his best, *Rural Rides*, 1830. He also wrote *A History of the Protestant Reformation in England and Ireland*, 1824-7. His great merit as an author was his clear, vigorous style. An active politician, he was always on the side of the oppressed. After 1804, when he was prosecuted for an article he had written on Ireland, C. became a violent critic of the administration. He was prosecuted by the gov. in 1810, and imprisoned in Newgate for 2 years; and in 1817, on the suspension of the Habeas Corpus Act, he went to America to escape a second period of imprisonment. He was one of the most strenuous advocates of parl. reform, one of the most valuable of his pubs., the *Register*, reaching a vast public. Appropriately enough, he was returned as a member of the first Reform Parliament, but he was then too old to achieve any marked success in a new sphere of activity. See L. Melville, *The Life and Letters of William Cobbett in England and America*, 1913; G. D. H. Cole, *The Life of William Cobbett* (new ed.), 1947; Margaret Bowen, *Peter Porcupine*, 1935; H. J. Massingham, *The Wisdom of the Fields*, 1945.

Cobbler, The, or Ben Arthur (2891 ft), mt of Argyll, Scotland, some 3 m. WNW. of the head of Loch Long. It has many short rock climbs.

Cobden, Richard (1804-65), politician, was the fourth of 11 children of a small Sussex farmer, brought up by relations in Yorks. Later he became a clerk, and then a commercial traveller, until in 1832 he set up in business on his own account as a calico merchant in Manchester. The business prospered, and eventually C. became a manufacturer, and found time to remedy some of the defects of his education. Economics was his favourite study, and he became an active advocate

of free trade. He gave expression to his views in pamphlets issued respectively in 1835 and 1836, *England, Ireland, and America*, and *Russia*. He entered Parliament in 1841. He was already a prominent member of the Anti-Corn Law League which had been founded at Manchester in the autumn of 1838, supported by Charles Villiers and John Bright. To obtain the repeal of the laws imposing a duty on the importation of corn was the matter nearest his heart, and it was on this subject that, on 25 Aug. 1841, he made his maiden speech in the House of Commons. The Irish famine of 1846 finally converted both Peel and Russell to C.'s view, and the Corn Laws were at last repealed, Peel acknowledging publicly C.'s share in the campaign against them. C. was hailed as the saviour of the poor. His exertions had, however, left him no time for the conduct of his own affairs, and his business was on the verge of bankruptcy; but ruin was averted, for a grateful nation subscribed £80,000 as a testimonial to him. In 1860 another subscription was started and realised £40,000. Nothing that C. did after the repeal of the corn laws was commensurate in value with his share in securing that measure, but after his prin. object was effected he strove in other directions to further free trade. His next most important achievement was the negotiation of a commercial treaty between France and England, to bring about which he went to Paris in 1859. He went as a private person, but when he had silenced the objections of the Fr. protectionists he was given official powers, and in 1860 he and Lord Cowley were the Eng. signatories to the treaty. C. was a consistent opponent of Palmerston's foreign policy, which he considered amoral and bellicose. See Lord Morley, *Life of Richard Cobden*, 1881, and J. A. Hobson, *Richard Cobden*, 1931.

Cobet, Carel Gabriel (1813-89), Dutch classical scholar and palaeographer, b. Paris. In 1846 was made prof. at Leyden, where he remained until his death. His chief works are *Noeae Lectiones*, 1858, *Variae Lectiones*, 1873, *Miscellanea Critica*, 1876, *Observationes Criticae*, 1877, *Collectanea Critica*, 1878, and *Brieven aan Geel*, 1892.

Cobh (pronounced *Cone*; formerly *Queenstown*), 14 m. by rail SE. of Cork, Rep. of Ireland, port of call for transatlantic liners in Cork harbour. St Colman's Cathedral, which has a carillon of 42 bells, stands on the high ground dominating the harbour. The Royal Cobh Yacht Club (1720) is the oldest in the world. Spike Is. is now an army coastal defence station. Pop. 5700.

Cobham, Lord, see OLDCASTLE, SIR JOHN.

Cobham, Sir Alan John (1894-), aviator. Commissioned 1917 in the Royal Flying Corps. In 1920 he undertook aerial photography for the Aircraft Manufacturing Co. Joined the De Havilland Aircraft Co., 1921. Same year began series of long flights; flew 5000 m. round Europe. Another tour, 8000 m., round

Europe and N. Africa in 1922; in June flew from Belgrade to London in a day. Flew 12,000 m. over Europe, N. Africa, and Palestine in 1923; also London to Brussels with 6 h.p. engine. In 1924 flew from London to Rangoon and back; in 1925-6 flew London to Cape Town and back; in 1926 England to Australia and back; won Britannia Trophy, 1923, 1925, and 1926; and in last-named year was made K.B.E. He was commander-pilot of a flying-boat expedition which flew completely round Africa, Nov. 1927 to May 1928. He later became the most important pioneer in the technique of refuelling aircraft in flight, a work in which he is still prominent.

Cobham, or **Church Cobham**, vil. in Surrey, England, situated on R. Mole, 4 m. W. of Esher. Pop. 7248.

Cobitis, genus of carp-like fishes popularly known as loaches, which are natives of Europe and the E. Indies. The spined loach is a European species found in Britain.

Coble, low, flat-bottomed boat with a square stern, of 1 ton burden, 20 ft in length, and 5 ft in breadth, rowed with 3 pairs of oars, and fitted with a lug-sail. It is used chiefly in the cod and turbot fishery. The name is also applied to a smaller boat in use by the salmon fishers.

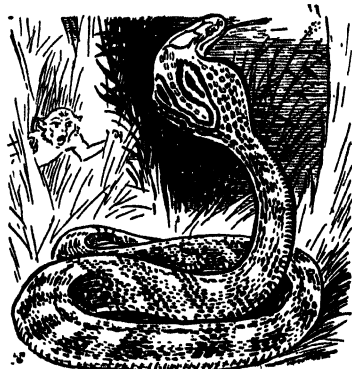
Coblentz, see **KOBLENZ**.

Coborn, Charles (1852-1945), music-hall comedian and singer, b. Mile End, London, son of a ship agent. His true name was Colin Whitton McCallum and he took his stage name at random from C. Road, Bow. He began his professional career at the Alhambra, Sandgate. In 1877 he played the title role in *The Man in the Moon* at the Theatre Royal. He made a name at Oxford as a coster comedian. His outstanding successes were his songs 'The Man who broke the Bank at Monte Carlo,' written and composed by Fred Gilbert, which he sang hundreds of times, and 'Two Lovely Black Eyes.' He did much for the comfort of the music-hall profession by forming, in 1885, the Music Hall Artists' Association. C. reappeared in 1927 in the 'Veterans of Variety,' later in broadcast programmes. In 1928 he pub. a vol. of reminiscences with the title of his Monte Carlo song.

Cobourg, cap. tn of Northumberland co., Ontario, Canada, 77 m. N.E. of Toronto, and situated on the N. shore of Lake Ontario. It possesses various factories, including a foundry and a matting mill. Pop. 7153.

Cobra, Portuguese name for sev. poisonous snakes in the colubrine genus *Naja* common to S. Asia and Africa. The most familiar of these is *N. naja*, or C. da capello, the hooded snake of India. The colours vary from pale brown to dark grey in some specimens, while others are dark brown and bear spectacle-like black and white markings on the neck, a portion of the body which becomes a hood-like expansion when the creature is roused. In habit the C. is usually nocturnal, and unless attacked is not, as a rule, dangerous; its diet consists of small vertebrates, e.g. rats and frogs; its length may

be from 4½ to 6 ft. Although it is terrestrial and conceals itself among stones during the day, it can both swim and climb gracefully and well. The King Cobra (*N. hannah*) reaches a length of over 16 ft.



COBRA

Cobra, King, or Giant, see **HAMADRYAD**.
Coburg (Ger. *Koburg*), Ger. tn in the Land of Bavaria (q.v.), lying among the foothills of the Thuringian Forest (q.v.), on the Itz, 148 m. N. by W. of Munich (q.v.). Formerly the cap. of Saxe-(' (see **SAXE-COBURG-GOTHA**). On a hill 520 ft above the tn stands a magnificent old fortress; it sheltered Martin Luther (q.v.) at the time of the Diet of Augsburg, and during the Thirty Years War (q.v.) it was sev. times unsuccessfully besieged. The fortress is now a museum, and includes among its exhibits a collection of 300,000 engravings. The ducal palace of C., *Schloss Ehrenburg*, was originally a Franciscan friary. There are numerous Renaissance buildings, and in the surrounding dists. there are fine castles and mansions: Albert, Prince Consort (q.v.), was b. at *Schloss Rosenau*, near by. There are agric. markets, and manufs. of textiles, baskets, porcelain, furniture, and beer. Pop. 47,000.

Coca, see **COCAINE**.

Coca Wine (*Vinum cocae*), wine used for stimulating effects, and consisting of one part of C. and 8 parts of wine. It is strongly medicated, and must contain half a grain of alkaloid in the ounce, otherwise it is necessary to have a licence before it can be sold.

Cocaine (C₁₇H₂₁O₄N), chief alkaloid found in the leaves of the coca-tree. *Erythroxylon Coca* is a shrub of the family Erythroxylaceae; it attains a height of 6-8 ft, and is met with in many tropical countries, particularly in S. America, where the natives have long been in the habit of chewing the leaves for the stimulating effects produced. When the practice has been long indulged in

the appetite for ordinary food falls, the subject tends to rely on the drug, and eventually collapse occurs. As an occasional tonic, however, coca leaves have considerable value, and are said to enable the Indians to perform remarkable feats of endurance. The properties of the plant were demonstrated in Europe by Christison, and many preparations of value as stimulants have been made with coca leaves extract as an important constituent. Many alkaloids have been found in the leaves, the most important being C. One extract is first made by steeping the coca leaves in hot water. The solution is then treated with lead acetate in order to precipitate tannin, etc., and the lead in the filtrate is precipitated by the addition of sodium sulphate. The solution is then rendered alkaline with soda and the C. extracted with ether and purified by recrystallisation from alcohol. C. forms colourless prisms melting at 98° C. It is soluble with difficulty in water, but forms salts readily. The preparation usually employed in medicine is the hydrochloride ($C_{17}H_{21}O_4N \cdot HCl$), which is readily formed by neutralising the alkaline extract with hydrochloric acid and evaporating the solution to crystallisation. The most important property of C. is its capacity for removing all sensation of pain on local application, and it is used for this purpose in dentistry and other minor surgical operations. Taken by the mouth, it acts first as a stimulant and then as a narcotic. It resembles caffeine in its effect on the nerve centres, and atropine in its effect on the respiratory and circulatory organs. The dose for internal use is from $\frac{1}{4}$ to 2 grains. For injection to produce local anaesthesia a 2-8 per cent solution of the hydrochloride is employed. C. has been found of great use in eye operations. When applied to the conjunctiva it dilates the pupil and abolishes pain. For some time after the application there is paralysis of the function of accommodation, so that the patient does not see clearly. For producing local anaesthesia various methods are employed, according to the nature and seat of the operation and the depth of anaesthesia desired. Simple external application to the skin has little effect, but the effect on mucous membrane is to produce a tingling followed by numbness with partial or total loss of sensibility to pain, according to the idiosyncrasy of the subject. There is usually a blanching of the surface, owing probably to constriction of the blood-vessels. Short operations in the nasal passages may be rendered painless by the application of C., also such operations as the removal of tonsils. A deep local anaesthesia can be produced in a superficial part by hypodermic injection. This is used not only for dental and other small operations, but also on occasions when general anaesthesia is dangerous or undesirable. Its use is avoided when possible, as in certain persons it is liable to cause depression of the heart, with possibly fatal results. Another disadvantage of its use is the impossibility of

sterilising C. by heat as it decomposes. There is therefore some danger of septic germs being introduced, although a fairly strong solution is not a favourable medium for the growth of micro-organisms. It is true that the distressing symptoms consequent upon the use of ether or chloroform are avoided, but C. is not free from painful after-effects, and sometimes the sensibility of the part is increased when the influence of the drug has passed away. C. is sometimes used to produce spinal analgesia, though it has been largely superseded by stovaine, eucaine, and novocaine. The method employed is the injection of the solution into the sac containing the spinal cord in the lumbar region. The effect produced is insensibility to pain in the lower part of the body. A danger always present in the administration of C. is the possibility of setting up the drug habit. Its employment, for instance, to modify recurrent pains tends to produce a craving for C. which is much more insidiously developed and more difficult to eradicate than the craving for alcohol. The patient simulates pain to procure the drug, even to the point of self-deception. The firm estab. of the habit leads to moral degeneration, sleeplessness, emaciation, and death.

Coccajo, Merlino, see FOLENGO, TEO-FILO.

Cocceius (Koch or Kohen), Johannes (1603-69), Dutch Hebraist and one of the leading exponents of the federal or covenant theology, an 'important attempt... to do justice to the historical development of revelation.' His disciples were known as Cocceians. His chief works were *Summa Doctrinae de Fodere et Testamento Dei*, 1648, and *Lexicon et Commentarius Sermonis Hebraici et Chaldaici Veteris Testamenti*, 1669.

Cocceji, Heinrich von (1644-1719), Ger. jurist whose *Juris Publici Prudentia* for a long time remained the text-book of Ger. civil law.

Cocceji, Samuel (1679-1755), Prussian statesman, who became chancellor to Frederick the Great in 1747 and reorganised the Prussian judicial system.

Coccidiosis, see POULTRY, Common Diseases.

Cocco, Coco, Scratch-coco, Taro, and **Eddoes** are names given to *Colocasia antiquorum* and var. *esculenta*, E. Indian species of Araceae. The C. is often used as a foliage plant; the rhizomes contain a poisonous property, but lose this when they are boiled, and form a nutritious food for the natives.

Coccoliths, microscopic organisms (which may be protozoans or algae) with characteristic calcareous plates which are found in deep-sea oozes and sometimes in geological formations such as the chalk.

Coccoloba, genus of Polygonaceae, consists of tropical plants of very handsome appearance, some of which produce edible fruits. There are more than 120 species, restricted to tropical and subtropical America. *C. uvifera*, the seaside grape, is a small tree, the leaves, wood, and bark of which are powerfully astringent

owing to the presence of tannin, and a decoction called Jamaica kino is evaporated from them. The wood is valued for cabinet-making and contains a colouring matter used as a dye; the fruit is edible and is sold in W. Indian markets, but is little valued.

Cocculus, dried berry of *Anamirta cocculus*. *C. indicus* is the commercial name of the drug. The berries contain a poisonous active principle known as picrotoxin, about which great care is exercised when it is used medicinally.

Coccus, genus of hemipterous-homopterous insects typical of the family Coccidae, of which the species are called familiarly scale-insects or mealy bugs. The females are wingless, and of a very degenerate type; when adult they fix themselves to a plant by means of their proboscis, and remain there until they produce their young and die. The males, however, are devoid of mouth parts, and consequently do not live long after fulfilling their one duty, that of fertilising the females. They are unlike their mates in being beautiful and well-developed creatures with anal cerci and a single pair of wings. Some of the coccids are destructive to vegetable life, while others are of value to man. Such are *Dactylopius coccus* which yields cochineal, and *C. (or Gossyparia) mannifera* (*C. manniparus*) which exudes the honey-dew supposed to be the manna of the O.T. This latter occurs on the leaves of *Tamarix gallica* var. *mannifera*. 'Lac' is produced by an Indian coccid (see SHELLAC).

Coccyx, terminal portion at the lower end of the spinal column below the sacrum, consisting of 4 or 5 vertebrae.

Cocentaina, Sp. tn in the prov. of Alicante, with arch towers and a 15th-cent. palace. Silk and linen are manuf. Pop. 9500.

Cochabamba, second largest city in Bolivia, cap. of C. dept and Cetado prov., railway terminus and main airport for internal services. The city enjoys an average temp. of 64-4° F. (altitude 8389 ft.). The prov. (area 23,030 sq. m.; pop. about 654,000) of which it is the cap. is sometimes called the granary of the rep. There are large herds of cattle and rich forests. The city is the distributing centre for the agric. products of E. Bolivia, and there is a rich mining region. C. has a cathedral and a univ., and is a tourist resort. Pop. 80,300.

Cochin, tn on W. coast of India, formerly in Cochin state, now in the merged state of Travancore-Cochin. It is commonly regarded as the earliest European settlement in India. The Portuguese Cabral was welcomed on a visit here in 1500, and in 1502 Vasco da Gama estab. a factory. He d. at C. in 1524. The Portuguese viceroy in 1510 was Albuquerque. An Eng. factory was estab. in 1635, but in 1663 C. was captured by the Dutch. It was finally taken by the British in 1795. It has a very ant. Christian tradition and first conversions are ascribed to the Apostle Thomas (AD 52). There have been many sects and heresies, but Christians from this area are commonly

called Syrian Christians. There is also a colony of Jews, of whom one section claims to have settled on the coast as early as the 3rd or 4th cent. AD. C. is now a fine harbour and port for cargo and passenger liners.

Cochin-China. Modern C.-C. is the southernmost of the 3 regions, Tonkin, Annam, and C.-C., into which France divided Viet Nam during the 19th cent. The name C.-C. dates from the 17th cent. About 1600 Viet Nam split into 2 separate kingdoms of which the S., ruled by the Nguyen emperors, was known to the Japanese traders by a name which sounded to European ears like Cochin. The 17th-cent. European traders, in order to avoid confusion with Cochin in India, called the kingdom C.-C., but the C.-C. of that time was little more than the S. part of modern Annam. It is also known to-day as Nam-bô (S. region). C.-C. is bounded by Cambodia and Annam to the N., by the China Sea to the E., and by the Gulf of Siam to the W. A peninsula to the S. ending in Point Ca-mau, it separates the China Sea from the Gulf of Siam. Off the coast are the Poulo Condore Is. and Poulo Obi in the China Sea, and the Phu Quoc group in the Gulf of Siam.

Its area is 26,476 sq. m. C.-C. is mostly a broad, low-lying, alluvial plain, including the deltas of the Mekong and Dongnai R.s., together with the Saigon It. and the Great and Little Vaicos. The coast region is swampy, and cane-covered marshes stretch far inland. Two canals connect the Bassac arm of the Mekong with the Gulf of Siam. The climate is subject to monsoons and is found to be somewhat oppressive by Europeans. Towards the N. there is higher land, mt summits rising to about 2000 ft. In the W. are the last outliers of the Elephant Mts of Cambodia. Forests in the NE. contain valuable woods for shipbuilding and cabinet-making. The gamboge-tree abounds. The ter. is covered by a network of roads, many of which are metalled, but much of the rice and other products is carried in junks through a complex system of rivs. and canals which converges on Cholon. C.-C. is an agric. region and its main crop is rice, of which 3 million tons were produced annually before the Second World War. Secondary products are rubber, coffee, tea, arca-nuts, betel-nuts, sugar-cane, coco-nuts, ground-nuts, maize, mulberry, cotton, pepper, palm oil, sweet potatoes, and various fruits. Water-buffaloes are much used for labour, also zebus. Among other animals found there are the elephant, rhinoceros, deer, wild boar, tiger, and many smaller animals. Peacocks, snipe, partridges, pheasants, and woodcocks also abound. Minerals are not very abundant, but phosphate of lime is found at Ha-tien, lignite and granite quarries are worked, and salt is produced on the coast from lagoons and pits at Soctrang, Bacieu, and Baria.

However, the agric. production was badly disorganised and damaged by the 1945-54 war and the subsequent internal disorders. Moreover a million refugees

from the Communist N. Viet Nam have come to C.-C. since 1954. Production figures are still well below those of pre-war days, but ambitious plans are being carried out with U.S. technical and financial aid to clear jungle, to drain swamps, and to improve irrigation. All this, together with the resettlement of the refugee immigrants—C.-C. has always been underpopulated—should raise C.-C.'s production to a new high level in a very few years. Strenuous efforts are also being made by the gov. to introduce new light industries to the area. Trade and commerce have been mainly in the hands of Chinese and Europeans, but the departure of the Fr. colonial administration, and the final departure of the Fr. armed forces in 1956, have led to the withdrawal of much Fr. capital and many Fr. commercial companies. More recently still the gov. issued decrees forbidding Chinese participation in specified branches of trade, closing down Chinese schools, and offering Vietnamese citizenship to all Chinese residents. It is not yet possible to estimate the effects which these events will have on the future trade of C.-C. The main commercial centres are the adjoining cities of Saigon and Cholon (qq.v.), which between them possess extensive docks and wharves, rice mills, distilleries, sugar refineries, tobacco factories, glass factories, and small textile mills. Storms prevail in May and Aug., while in July, the brief dry season, dysentery and fever are most prevalent. The seasons are very regular and the harvests generally good. The pop. of C.-C. is mainly Vietnamese, but there are considerable numbers of Chinese and Cambodians as well as backward Moi tribes in the hills and jungles, and some Europeans mainly found in Saigon. Sev. religions flourish side by side, the greatest, numerically, being Rom. Catholicism with approximately 2 million adherents, Buddhism and Cao-daiism (qq.v.) with over a million each, and unspecified numbers who still follow the traditional religion of Viet Nam, which is ancestor-worship coupled with different forms of animism. The cap. of C.-C. is Saigon, which is also the seat of the gov. of S. Viet Nam (see VIET NAM). This city is to-day very overcrowded because of the influx of people from the erstwhile unsettled countryside, because of the influx of refugees from N. Viet Nam, and because of the adoption of Saigon as the centre of gov. The combined pops. of Saigon and Cholon to-day exceed 2 million people (pre-war approximately 400,000). Education is administered by the gov. of S. Viet Nam (see VIET NAM) and there are numbers of primary and secondary schools as well as a univ. in Saigon. Some Fr. lycées continue to operate. The ter. of C.-C. formerly belonged to Cambodia and Champa, but the Vietnamese people pushed southwards for sev. cents., overrunning Champa entirely and completing the capture of C.-C. from Cambodia in 1780. In 1862 the 3 E. provs. of C.-C. were ceded to France and the whole of C.-C. became a Fr. colony in 1867. It was made part of

the Indo-Chinese Union in 1887. Japan occupied C.-C. during the Second World War and, after the capitulation of Japan in 1945, a Brit. force under the command of Gen. Gracey arrived to disarm the Jap. soldiers. Gen. Gracey handed the ter. back to the Fr. authorities, but a Vietnamese nationalist movement, which later fell under Communist control (see VIET MINH), opposed the return of Fr. rule and began a war which lasted until 1954. In 1954 France granted independence to Viet Nam and, at the Geneva Conference on Indo-China held in the summer of that year, agreed to withdraw all Fr. forces. C.-C. to-day forms the largest part of the Rep. of Viet Nam. For bibliography see VIET NAM.

Cochineal, natural dye-stuff employed in dyeing scarlet, crimson, and orange, and in the preparation of the pigments lake and carmine. It consists of the bodies of the female insects of the *Coccus cacti* (family Coccidae, order Hemiptera), so called because the chief food of the species is a variety of cactus, particularly the nopal, found in Mexico and Peru. It is now also cultivated in Algiers, Spain, etc. The insects are collected from the plants into bags, and killed either in an oven or by exposure to the sun or steam. Different kinds of treatment produce the various varieties of C., the best being known as silver, the next as black, and an inferior quality as granilla. The use of C. reached Europe from Mexico in the 16th cent. Formerly widely used as a dye, C. is now only employed for special purposes, e.g. uniforms, hunting coats, etc. See DYE.

Cochlaeus, Johannes (properly Dobnsek) (1479–1552), Rom. Catholic controversialist and writer, b. Wendolstein. He sat on the Rom. Catholic side in the first communion at Augsburg, and at the Regensburg Colloquy in 1546. His best-known work is *Commentaria de Actis et Scriptis Lutheri* (1549; Ger. eds. 1580 and 1582). His *Kleine Schriften* were ed. by J. Schweizer in 1920. Other works are *De Matrimonio Regis Angliae*, 1535, and *Scopa in Araneas Ricardi Morysini Angli*, 1538 (both written strongly against the marriage of Henry VIII of England with Anne Boleyn), and *Historia Hussitum*, 1549. His life has been written by Spahn, 1898.

Cochlea, see EAR.

Cochlearia, genus of 15 species of herbs, natives of Europe and N. America, family Cruciferae. *C. armoracia* is the perennial Horse-radish, naturalised in Britain; *C. officinalis* the biennial Sourry Grass, reputed for antiscorbutic properties when fresh, having a tarry flavour.

Cochran, Sir Charles Blake (1872–1951), theatrical manager, b. Brighton, Sussex. Educ. at Brighton, where he was influenced towards the theatre by Aubrey Beardsley. He acted in America from 1890 to 1893. In 1897 he produced *John Gabriel Borkman*. His first London production was *Sporting Simpson*, at the Royalty Theatre in 1902. He produced more than a hundred shows, and made a big success with *The Miracle* at Olympia.

He won fame also as a promoter of large-scale entertainments of all kinds—including boxing and wrestling matches. Probably his greatest period was between 1918 and 1931, when he produced a succession of revues at the London Pavilion. He was associated with Noel Coward in *Bitter Sweet* and *Cavalcade*, and one of his greatest successes, *Bless the Bride*, was running at the Adelphi Theatre shortly before he *d. See* CIRCUS. It was C. who introduced Hackenschmidt (q.v.). Pub. *The Secrets of a Showman*, 1925. *Cock-a-doodle-do*, 1941, *A Showman Looks On*, 1945.

Cochrane, Sir Alexander Forrester Inglis (1758–1832), admiral who took part in the actions off Martinique in the *Montague*, 1780. In 1795 he seized 2 large Fr. store ships out of a squadron of 5. In Lord Keith's expedition to Egypt in 1801 he commanded the *Ajax*, and in 1806 he took a prominent part in the battle off San Domingo, being second in command under Duckworth. He was uncle of the celebrated Adm. Thomas (Lord) C., Earl of Dundonald, and father of Adm. Sir Thomas John C.

Cochrane, Douglas Mackinnon Baillie Hamilton, 12th Earl of Dundonald (1852–1935), soldier. He entered the 2nd Life Guards in 1870; served in the Nile expedition from 1884 to 1885, was in Stewart's march to the relief of Khartoum, and fought at the battles of Abuklea and Goubat. In the Boer War he was present at the battle of Colenso, and at the head of the 2nd Cavalry Brigade was the first to enter Ladysmith at the raising of the siege by Sir Redvers Buller (28 Feb. 1900). Commander of the Brit. forces in Canada, 1902–4, but recalled by the secretary of state for war following differences with the Canadian Gov. He pub. *My Army Life*, 1926.

Cochrane, Robert, Earl of Mar (d. 1482), Scottish architect, and a favourite of King James III. He is said to have been associated in the building of Parliament House at Stirling.

Cochrane, Thomas, 10th Earl of Dundonald (1775–1860), admiral, began his career in the navy when about 18 years old, and in 1801, when he held the post of commander of the *Speedy*, distinguished himself in the service. Some years later he was elected member for Westminster, and endeavoured in that capacity to reform the Admiralty. He saw a good deal of service against France, but at Aix roads in 1809 he was not successful in his attempt to bring about the destruction of the Fr. fleet, and although the fault was the caution of C.'s admiral, C. had to bear the blame. In 1814 he suffered expulsion from the navy on a false charge of fraud, was expelled from Parliament, and was imprisoned. He escaped, and was re-elected for Westminster. He was, however, recaptured, and had to serve one year's imprisonment. He entered the service of Chile and commanded that country's navy during the war of Liberation, winning sev. fights. After this he did brilliant service in defence of the independence of Brazil (1823–5), and

in 1827–8 was in the service of Greece. By the year 1832 he had managed to regain his position in the Eng. Navy, being made an admiral. He also served as commander-in-chief in the N. Amer. and W. Indies station, 1848. It was under C. (then a captain) that Marryat, in 1806, started on his first voyage in H.M.S. *Imperieuse* for the Mediterranean (see autobiographical incidents in Marryat's *Frank Mildmay*). 'Capt. Savage' in *Peter Simple* is generally conceded to be meant for Capt. C. of the *Imperieuse*. C.'s autobiography contains a hist. of the *Imperieuse*. He wrote *The Autobiography of a Seaman*, 1860–1. See life by his son; also J. B. Atlay, *The Trail of Lord Cochrane before Lord Ellenborough*, 1897; C. Lloyd, *Lord Cochrane*, 1947.

Cochrane, Sir Thomas John (1789–1872), admiral, son of Adm. Sir A. F. I. C. While commanding the *Surprise*, 1813, he captured the *Decatur*, an Amer. privateer, afterwards assisting in the attacks on Washington and Baltimore.

Cock, Edward (1805–92), surgeon, b. Tottenham, Middx, apprenticed at the age of 16 to his uncle Sir Astley Cooper, at St. Thomas's Hospital. On the separation from St. Thomas's of Guy's Hospital in 1825 he was appointed demonstrator of anatomy at the latter hospital. He became assistant surgeon in 1838, surgeon in 1849, and consulting surgeon in 1871. C. was probably the first to perform the operation of pharyngotomy (1856). His chief work was *Practical Anatomy of the Head, Neck, and Chest*, 1835.

Cock-fighting, anct and widely practised sport, consisting of the pitting against each other for fighting of specially bred and trained game-cocks. It appears to have been known in India, China, and Persia, and was introduced into Greece from the E. during the time of Themistocles. From here it spread to Asia Minor, Sicily, and Rome, and from Rome northward and westward over the greater part of Europe. In most European countries it is now illegal, but it is still practised in Spain, and is popular in Sp. S. America, China, Siam, and the Malay Peninsula. It was probably introduced to England at a very early date by the Romans, but our first definite knowledge of it comes from a description by Wm FitzStephen, in the reign of Henry II, of the cock-fights at schools on Shrove Tuesday. It reached its highest popularity in the time of Edward III, and though it was prohibited, on account of the gambling it entailed, about 1366, it continued to be a favourite sport for many cents. Henry VIII built the famous royal cockpit at Whitehall, and the pastime was known as 'the royal diversion' during the time of the Stuarts. James I and Charles II were enthusiastic devotees, the former being said to have attended at least 2 fights a week. C. was rigorously opposed by the Puritans, and Cromwell managed to suppress it entirely for a short time. It was finally abolished by law in 1849, having reached its zenith in Regency days, but is still carried on more or less

clandestinely. The sport was introduced into Scotland about 1681, and here partridges were frequently used instead of cocks, while in Wales a special form of combat, known as the Welsh main, was evolved. The cockpits were usually circular, about 20 ft in diameter, consisting of a stage covered with matting and surrounded by a barrier round which the audience stood. Almost every town in the kingdom had one, the larger prov. cities 3 or 4 each, and London a considerable number, of which the best known were in Westminster, Drury Lane, Jewin Street, Birdcage Walk, Pall Mall, the Haymarket, and Covent Garden. The usual form of combat was that in which an agreed number of pairs of birds fought together, the final result being decided by the majority of victories on one side or the other. In the Welsh main, on the other hand, 8 pairs fought, and the 8 victors were paired and fought again, and so on till only 1 bird was left alive. There was also the battle royal, in which a certain number of birds were set upon each other and left to fight till all but one were killed. The game fowl is probably the nearest modern variety to the original Indian jungle-fowl. A cock is fought when 1 or 2 years old, and is trained by diet and exercise for about a month previously. The wings, tail, hackle, rump, and comb are all carefully trimmed, and spurs, from 1 to 2½ in. long, attached to the heels.

Cock Lane Ghost, imposture which agitated London about 1762. A house in Cock Lane, Smithfield, tenanted by a man named Parsons, was said to be haunted by mysterious noises and by the apparition of a Mrs Kent, who had *d.* there 2 years before. Inquiry revealed that the visitation was the work of Parsons's little daughter, aged 11, and was a scheme on the part of Parsons to blackmail Kent by making it appear that he had murdered his wife. Parsons was condemned to stand in the pillory 3 times and to 2 years' imprisonment. The house was visited by large crowds, among them being Dr Johnson.

Cock of the Rock, or *Rupicola*, genus of S. Amer. passeriform birds, the males of which are very handsome, with a purple-crested head and general orange colour, and have the curious characteristic of performing a strange dance before an assembly of their species. The hen bird is dull-coloured, and does not partake of her mate's antics.

Cock of the Wood, see CAPERCAILLIE.

Cock-penny, payment formerly made by the scholars of certain schools, especially in the N. of England, to their master at Shrovetide. It was originally intended to defray the expenses of cock-fighting, a regular institution at the schools.

Cockade (Fr. *cocarde*, probably alluding to cock's comb), modern substitute for the badge worn in olden days on the dress or appointments of the servants of the house. Custom is the only authority for its use, and excepting casual references in the description of military accoutrements, no official recognition of the C. occurs.

Probably the earliest C.s known were those which were worn in Scotland for William of Orange at the time of the revolution. The white C. was that worn by the Jacobites, while a black one was used by the house of Hanover and by the household of the estab. gov. From the hats of the military it passed on to those of the civil servants of the Crown, and as headgear changed in fashion the use of the C. became confined to servants only. Hence the custom of generations was estab. by which the use of the C. is confined to the servants of those who bear commissions from the Crown or its delegates, i.e. justices of the peace, who receive commissions from the lord-lieutenant of the co.

Cockaigne, Land of (O.F. *coquaigne*, modern Fr. *cocagne*, coming through It. *cocagna* and Lat. *coquere*, to cook, and perhaps literally meaning land of cakes), imaginary land familiar in medieval romances, in which it was possible to live a luxurious life of perfect idleness. All the features of the landscape were good to eat or drink; the rivs. were of wine, the houses of cakes and sweetmeats, and the streets of pastry, while roasted geese and fowls and buttered larks went about asking to be eaten. There is a 13th-cent. Eng. poem, *The Land of Cockaigne*, which ridicules monastic life.



COCKATOO

Cockatoo, bird belonging to the family Psittacidae, of the order Psittaciformes. They are closely related to the true parrots, with which they are commonly considered. True C.s are light in colour, generally white with tinges of red and orange. They are found in Australasia and the E. Indian Is. The term is often extended to include allied genera of dark plumage, such as the black C. In heraldry a C. is a beast with head, shoulders, and legs of a cock, and the body, wings, and tail of a wyvern.

Cockatrice, fabulous monster, believed in ant and medieval times (see Pliny, *Natural History*, and Aldrovandus, 17th cent.) to come from a cock's egg hatched

by a serpent and to have power to wither plants (except rue) and to kill men and animals (except the weasel) by its glance. A cock's crow killed it—so travellers took the bird with them as a protection. In the Bible *C.* merely means a venomous reptile. It is sometimes identified with the basilisk.

Cockburn, Sir Alexander James Edmund (1802–80), lord chief justice of England. Came of an old Scottish stock; son of Alexander C. of the diplomatic service. He was educ. at Trinity Hall, Cambridge; became a barrister in the Middle Temple, 1829; recorder of Southampton, 1840–6; Q.C., 1841; M.P. for Southampton, 1847–1856; solicitor-general, 1850. His opening speech in the prosecution of Palmer in the celebrated Rugeley murder case in 1856 is famous as a forensic model of its kind. C. defended (1843) the crazy Scotsman, McNaughton, who shot Sir Robert Peel's secretary, Drummond, and estab. the defence of insanity, initiating the general rule (see McNAUGHTON'S CASE). Briefed against Attorney-General, Thesiger, in the case of *R. v. Newman* (later Cardinal Newman), a libel prosecution launched against Newman who had denounced a philligine Itom. Catholic friar named Achilli, who was lecturing on Rom. Catholicism in England. The verdict against Newman was set aside. C. was knighted in 1850; in 1851 he was made attorney-general; recorder of Bristol, 1854–6; and became lord chief justice of court of common pleas in 1856, of court of queen's bench in 1859, and of England in 1874. C. was presiding judge in the Tichborne trial and an arbitrator in the *Alabama* dispute. A man of brilliant abilities and of high reputation as a judge. See *The Greville Memoirs* (ed. H. Reeve), 1874–87; J. McCarthy, *History of Our Own Times*, 1881–1905; W. Ballantine, *Experiences*, 1890.

Cockburn, Alicia, or **Alison** (1713–94), poetess, *b.* Fairlie, Selkirkshire, a daughter of Robert Rutherford. A very beautiful girl, she married in 1731 Patrick C., advocate, and was for 60 years a queen of Edinburgh society. Although she wrote verse all her life, she is remembered almost solely by her poem *The Flowers of the Forest*, which begins 'I've seen the smiling of fortune beguiling.' It is commonly assumed to have the same subject as the poem of Jean Elliot (q.v.) with the same title, which is a lament for Flodden, but in fact it was occasioned by a wave of financial ruin which affected many in the Elrick Forest neighbourhood. Her letters were pub. in 1900.

Cockburn, Catharine, née Trotter (1679–1749), miscellaneous writer. Her works include *Verses on Congreve's 'Mourning Bride'*, 1697; 3 tragedies, *Agnes de Castro*, 1696, *Fatal Friendship*, 1698, and *The Unhappy Penitent*, 1701; a comedy, *Love at a Loss*, 1701; and *Writings in Defence of Locke*, 1702 and 1706.

Cockburn, Sir George (1772–1853), admiral who served under Nelson with the frigate *Minerva* during 1796–1802. From 1803 to 1805 he commanded the *Phaeton* in the E. Indies; and in 1813

took an important part in the capture of Washington; in 1815 became commander-in-chief at St Helena, having conveyed Napoleon there from Plymouth.

Cockburn, Henry Thomas, Lord (1779–1854), jurist and judge, *b.* near Edinburgh, the son of Archibald C., a baron of the Scottish court of exchequer. In 1831 he became lord rector of the univ. of Glasgow, and in 1834 was promoted to the bench as one of the lords of the court of session, under the title of Lord C. He was appointed a lord commissioner of justiciary in 1837. He pub. a *Life of Lord Jeffrey*, 1852, while *Memorials of his Time*, a book full of humour and interest, was pub. posthumously in 1856.

Cockburn, Sir John Alexander (1850–1929), Anglo-Australian statesman, *b.* Corsbie, near Duns, Scotland; in 1875 he settled in S. Australia, and in 1884 was elected to the House of Assembly as representative for Burra, and in 1887 for Mt Barker. He was minister of education, 1885–7; premier and chief secretary, 1889–90; chief secretary, 1892; minister of education and agriculture, 1893–8. Made K.C.M.G. in 1900. He represented S. Australia at the Federal conferences and at numerous international congresses, and wrote *Australian Federation*, 1901.

Cockchafer, or *Melolontha vulgaris*, lamellicorn coleopterous insect in the family Scarabaeidae and section Melolonthides. The larvae are found in dung or in decaying vegetable matter or buried in the ground. The beetle is of a brownish colour, is over an inch in length, and is destructive to crops. When in flight it emits a loud whirring sound. Its life is short, but the larval stage is of very long duration, lasting from 3 to 5 years, most of which time is spent at some depth below the soil. The C. is common to continental Europe, but is not so frequently found in England.

Cockcroft, Sir John Douglas (1897–), *b.* Todmorden, physicist, formerly Jacksonian prof. of natural philosophy at Cambridge, and, 1946–58, director of the Atomic Energy Research Estab. of the Ministry of Supply. Working under Rutherford at Cambridge he constructed (with Walton) apparatus for accelerating atomic nuclei to very high speeds, and with this was able to produce the first examples of completely artificial transmutation (i.e. the conversion of nuclei of one element to those of a different kind). Rutherford had previously shown that such transformations sometimes occurred when alpha particles from radioactive material collided with atoms, but prior to C.'s experiments no nuclei had been artificially accelerated to speeds sufficient to produce similar changes. He has contributed a number of papers to the Royal Society, amongst which are some reports on his work on high velocity positive ions. In 1936 he was elected F.R.S. and was awarded the Hughes Medal in 1938 and Royal Medal in 1954. He was assistant director of atomic research at the ministry of supply in 1942, and director of the atomic energy div. of the national research council of

Canada 1944-6. He received the Nobel prize in 1951.

Cockenzie and Port Seton, joint burgh and fishing port on NW. coast of E. Lothian, Scotland, on the Firth of Forth, 1 m. E. of Prestonpans, and 4 m. NE. of Musselburgh. The 2 vils. now form 1 small port. Pop. 3180.

Cocker, Edward (1631-76), engraver and teacher. His famous *Cocker's Arithmetic*, pub. posthumously by John Hawkins, 1678 (confined to commercial questions only), was popular for nearly a cent. More than 100 eds. were sold. 'According to Cocker' (meaning, in accordance with strict rule or reckoning) became a proverbial phrase. 'Daniel's Copy-book engraved by Edward Cocker, Philomath, 1664,' is preserved in the Brit. Museum. Other works were *A Guide to Penmanship, Tutor to Arithmetic*, and *Complete Arithmetician*. See Pepys's *Diary*, 10, 11 Aug. 1664, and A. De Morgan's *Arithmetical Books from the Invention of Printing to the Present Time*, 1847.

Cocker Spaniel, small breed of dog, of Sp. origin; reared for work with the gun, especially for woodcock shooting. It has a soft, wavy coat, black, red, or cream; short legs, square muzzle, and long, low-set ears. See SPANIEL.

Cockerell, Charles Robert, R.A. (1788-1863), architect, b. London, the son of a architect. He was trained by his father, then under R. Smirke (q.v.). Travelled extensively in Greece and Italy, 1810-1817; started independent practice on returning to London, 1817; succeeded his father as surveyor to St Paul's, 1819; and became architect to the Bank of England, 1833. From 1840 to 1857 he was prof. of architecture at the Royal Academy. He was the first recipient of the Royal Gold Medal for Architecture, 1848, and president Royal Institute of British Architects, 1860. His most important building is the Taylorian Institute, Oxford, 1841-5. His book on *The Temples of Aegina and Bassae*, 1860, is notable.

Cockerell, Sir Sydney Carlyle (1867-), palaeographer, educ. at St Paul's School. From 1889 to 1892 he was a coal merchant. Secretary to Wm Morris and the Kelmscott Press, 1892-8 (see MORRIS, WILLIAM). Director of the Fitzwilliam Museum (q.v.), 1908-37. Fellow of Jesus College, Cambridge, 1910-16, of Downing College, 1932-7. He was a literary executor of Wm Morris, Wilfrid Scawen Blunt, and Thomas Hardy, and has written various bibliographical monographs, especially on illuminated MSS.

Cockermouth, tn in Cumberland, England, at the confluence of the Derwent and Cocker Rs., 25 m. from Carlisle. There are Rom. remains near by, and C. has the ruins of an 11th-cent. castle, destroyed by the Parliamentarians in 1648. The poet Wordsworth was b. here in 1770. C. borders on the Lake Dist., and is an agric. centre and mkt. tn for the surrounding area, with sev. light industries, the largest of which is the manuf. of shoes and slippers. Pop. 5250.

Cookie-lecky, or **Cocky-lecky**, soup,

common in Scotland and the N. of England, made from a fowl boiled with leeks.

Cockle, popular name of members of the Cardidae, a family of eulamellibranchiate molluscs. The species are widely distributed in many seas, especially those of the tropics. The shells are strong, heart-shaped and ribbed, and the foot is long and bent. By means of this foot the C.s burrow in mud and sand and also leap over the sand for a short distance. *Cardium edule* is the edible C. familiarly known in Britain as an article of diet.

Cockney. The etymology is now generally accepted that C. derives from M.E. *coken-ey* (apparently from O.E. *coken*, 'of cocks,' and *ey*, 'egg,' from which the meaning extended to children that sucked too long, in other words cockered children, milksops). The special application to Londoners appears to have come about through countryfolk regarding Londoners as cockered and squeamish, too fine-bred for country taste, and as such it was in common use in Elizabethan times, and may go back considerably earlier. London at that time being just the City, it followed that a Londoner was one born within the sound of the loud and famous Bow bell (i.e. the bell of St Mary-le-Bow Church, Cheapside). In modern usage the term is applied, sometimes contemptuously or banteringly, and sometimes affectionately, to the uneducated Londoner and his speech and humour.

Cockpen, par. of Midlothian, Scotland, 2½ m. S. of Dalkeith. Dalhousie Castle, formerly the residence of the Marquess of Dalhousie, Governor-General of India 1847-56, is the Dalhousie family seat. The grounds include those of the Laird o' C. of Scottish song. Pop. 5700.

Cockroach, term employed in speaking of either the whole family of orthopterous insects known as Blattidae, or of certain members only of the family. The species are very widely distributed, and the Brit. black-beetle is a true C., bearing little resemblance to a beetle. Some of the species are wingless, but usually the male has 2 well-developed pairs of wings—a stiff front pair called the *tegmina*, and a membranous hind pair—and the female bears rudimentary structures to represent each pair. In habit the insects are omnivorous and nocturnal. The female has a broader abdomen than the male, and her eggs are laid in hard capsules. *Phyllodromia germanica*, the croton bug of America, is common also in Europe, and is a representative species of C.; *Blatta* (or *Periplaneta*) *orientalis* is the pest of Brit. kitchens. *Periplaneta* is also the generic name given by some entomologists to a flying species, *P. americana*, and to the Australian C., *P. australasiae*. See L. C. Miall and A. Denny, *The Structure and Life-history of the Cockroach*, 1886.

Cocksoomb, see CELOSIA.

Cock's-foot Grass, pasture grass of Europe, Asia, and N. Africa, valued as an excellent yielder producing herbage of high feeding value. It must be grazed when young, for with increasing age it

loses its palatability and if not kept in check becomes very aggressive in the pasture. Sev. commercial and indigenous strains are available, each having a particular use. See also DACTYLIS GLOMERATA.

Cocktail: 1. *Alcoholic*, a mixture of strong drinks, cold, short, and spirituous, intended to be 'a bugle call for meals.' The C.'s popularity in the U.S.A. was mainly due to the drinking of iced water at meals instead of wine. The number of possible C.s is unlimited, but perhaps the best known are the Martini (gin and vermouth), the Manhattan (rye whisky and vermouth), the Old Fashioned (rye whisky, bitters, sugar, and water), the Side Car (Cointreau, brandy, and lemon juice). See 'Robert' of the Embassy Club, *Cocktails, How to Make Them*, 1922, and T. E. Carling, *The Complete Book of Drink*, 1953.

2. *Non-alcoholic*. C.s of this type are of Amer. origin, but are now popular in Great Britain. They are prepared from a wide variety of fruits and vegetables. Soft fruits are pulped and sieved, hard fruits and vegetables are processed to extract juice. Juices are mixed and flavoured with herbs, spices, sugar, and ketchup, and chilled before serving. Alternatively fruit is served in carefully prepared portions covered with iced liqueur; sometimes a combination of sweet and sour fruit is used to give piquancy.

3. *Fish Cocktails* are made from a basis of shellfish *purée*, flavoured with vinegar, cream, mayonnaise, etc. They are served at the beginning of a meal in place of *hors d'œuvre*.

Cockton, Henry (1807-53), novelist, b. London. He is remembered only for 2 of a number of novels: *The Life and Adventures of Valentine Vox, the Ventriloquist*, 1840, and *Sylvester Sound the Sonambulist*, 1844.

Cocles, Horatius, see HORATIUS COCLES.

Coco, riv. of Nicaragua, Central America, formerly known also as Wanks, or Segovia. (These names are still popularly applied to the first third and second third of its course.) It rises in Honduras and almost immediately enters Nicaragua, forming most of the N. boundary between Nicaragua and Honduras, as arbitrated by the King of Spain in 1906. It flows 300 m. into the Caribbean Sea at Cape Gracias-a-Dios. It is navigable for about 140 m., but large vessels cannot pass the sand-bar at the mouth.

Coco (plant), see COCCO.

Coco de Mer, so called from the fact that it was first seen floating on the Indian Ocean, is the fruit of a species of palm. The double coco-nut, as it is sometimes termed, is the largest fruit known, and takes 10 years to attain maturity.

Cocoa and Chocolate are derived from the cocoa bean, seed of the tree *Theobroma cacao*, member of the family Sterculiaceae, related to mallows and linden. Originally wild in Central America; now cultivated in tropical belt 20° N. and S. of equator, requiring mean shade temp.

80° F. with only occasional variations of 15° above or below, and rainfall of at least 50 in. per annum, without marked seasonal fluctuations. The prin. producing countries are Africa (Ghana, Nigeria, Fr. and Portuguese W. Africa); America (Brazil, Venezuela, Ecuador, etc.); the Dominican Rep., Trinidad, and other W. Indian Is.; also Ceylon, Java, and New Guinea. The possibility of commercial production in Malaya, Brit. Guiana, etc., is being explored.



Cadbury Brothers Ltd

A WEST AFRICAN COCOA FARMER
HARVESTING HIS CROP

The tree is 15-25 ft high, with broad-leaved luxuriant foliage. Flowers are small, pale pink, pale yellow, wax-like texture; the fruit produced in pods; buds, flowers, and fruit at all stages of development are present simultaneously; pods grow on main trunk and branches. A tree produces 6000 flowers, but only 10 to 60 mature. Pods differ in size (6 to 10 in.), shape (gherkin or lemon to melon) and colour (yellow, maroon, crimson-purple). There are 2 main varieties: *Criollo* (lemon-shaped, broad at stalk end, skin soft and furrowed) and *Forastera* (smoother and harder with great variety of shapes). The pod contains 20 to 40 seeds ('beans') in white pulp, sweet and faintly acid to first taste but bitter and astringent on biting. *Criollo* seeds are large, plump, and white; *Forastera* smaller, flatter, and heliotrope; some trees yield both colours. The yield varies, but the typical 1-lb. pod produces 4-oz. seeds = 1½ oz. commercial cured bean. Yield higher in Brit. W. Africa, but average yield of dried cocoa in all growing countries probably 2 lb. per tree (= 1 lb.

commercial cocoa powder) or less. *Criollo* gives a distinctive flavour and moderate yield, *Forastera* a good chocolate flavour and high yield.

Cultivation, harvesting, and marketing. In S. America and the W. Indies cultivation is on plantations, in W. Africa on small native-owned farms. Trees are protected from wind by other plantings and usually from sun, but practice varies; they can be intermingled with 'catch crops,' e.g. yams. The tree bears at 4 to 5 years, reaches maturity at 10 to 15 years, and continues for 30 to 40 years. Ripe pods are present throughout the year, but there are usually 2 harvests. The pods are separated from tree by cutlass (machete) or hooked knife on a long pole (goulet). The pods are then cut open, and the beans and pulp scooped out: these are placed in heaps on ground and covered with leaves, or in 'sweating boxes'; the pulp ferments and drains away. This process develops the chocolate flavour and changes the interior to chocolate brown. This is necessary in order to produce beans of suitable quality. The beans are then dried, usually in the sun.

World production, consumption, and price. The most remarkable feature of world production is the enormous growth of the industry in Ghana (Gold Coast) to which cocoa was introduced about 1879. The export in 1890 was a mere 80 lb., while to-day, with Nigeria, Ghana produces more than half the world yield, and nearly double the whole world production of 1909. In 1939 world production reached a peak of over 700,000 metric tons, of which Brit. W. Africa accounted for nearly 400,000 tons. In the same year world consumption nearly equalled production. During the past 4 years the average ann. world production has been over 800,000 tons, and in the year 1955-1956 it exceeded this. The bulk of raw cocoa comes from Africa, mainly W. Africa, African production now being about 490,000 tons per annum. The ann. production from Central America, with which, for convenience, is included the W. Indies, is from 60,000 to 70,000 tons, and from S. America about 170,000 to 200,000 tons. Asia (5000 to 6000 tons) and Oceania (6000 tons) make up the balance.

Over three-quarters of this production is taken up in 7 countries, a third being consumed by the U.S.A. and the U.K.; Germany, the Netherlands, and France buy 10, 7, and 6 per cent respectively. Europe takes about half of world production, Amer. countries about 45 per cent.

In Ghana and Nigeria gov.-sponsored marketing boards have subsidiary selling companies in London. The buying organisations of the big manufacturers and trading firms have since 1947-8 become licensed buying agents of the marketing boards, which purchase direct from the farmers and fix the price for 12 months ahead. In the Fr. W. African ters. there are no marketing boards, and trading organisations buy direct from local farmers and sell through their representatives

in the cocoa markets of the world. The price of cocoa beans has fluctuated considerably in recent years, reaching £30 per cwt at one stage; at the beginning of 1957 it was £9 10s. per cwt.

Pre-war consumption (estimated) in the U.K. of chocolate and sugar confectionery was 7.1 oz. (representing 5.3d.) per head per week, of which 3.2 oz. (2.9d.) was chocolate. Under rationing, consumption in the U.K. was reduced to 3 oz. During 1956 consumption of chocolate and sugar confectionery amounted to 8½ oz. per head per week (representing 12.7d. on chocolate and 10.1d. on sweets).

Manufacture. The initial processes in manuf. of drinking cocoa (powder) and chocolate for eating and drinking are the same. Mechanical sieves and magnetic separators remove foreign substances from beans, which are roasted in revolving drums heated by coke fires, gas jets, or super-heated steam. This brings out the aroma and facilitates breaking of bean into small pieces ('nib') and winnowing away of shell. Blending takes place at this stage. The nib is then ground. Owing to the high fat ('cocoa butter') content (56 per cent), grinding produces a viscous brown liquid, as fat is melted by heat generated. When cool the liquid solidifies. Hydraulic presses, exerting pressure up to 6000 lb. per sq. in., extract a fixed proportion of cocoa butter, which is refined for chocolate manuf. and other purposes. Cocoa remains as dry, hard cakes, which are broken up, ground and reground to powder, and sifted through silk for drinking cocoa. In a modern factory all stages of production, including tin-making, are embodied in a series of 'linked processes' involving automatic and semi-automatic machinery, gravity being largely used for conveyance of material.

Eating chocolate. While cocoa powder consists of bean minus some of its cocoa butter, chocolate contains full butter content of bean plus extra cocoa butter added to compensate for increased bulk due to inclusion of sugar. Eating chocolate is of 2 main kinds: moulded and couverture (or confectionery). Couverture for covering fruits, nuts, biscuits, preserves, and other 'centres' needs a higher proportion of butter than chocolate for moulding into blocks. Balance in production of C. and C. is therefore important to the manufacturer. He does not want to buy cocoa butter nor, generally speaking, to produce a surplus, though there is a market for this in manuf. of other confectionery and of cosmetics and other pharmaceutical preparations. In chocolate manuf. finely powdered sugar, extra cocoa butter, and cocoa 'mass' are mixed and ground in a *mélangeur*, in which heavy granite rollers rotate on a revolving granite bed. The material is kept warm enough to be plastic and is delivered to a series of refining machines. The first consists of rolls revolving at different speeds and delivers the chocolate in dry, flaky condition. Another process is conching (so called from shape of machine: Fr. *conche*, a shell) in which

semi-liquid mixture is mechanically kneaded for long periods. For confectionery chocolate a fluid product is required. 'Centres' pass on a moving wire mesh under a curtain of chocolate. Decoration is added with a fork or other implement. Hand-covering is also practised, centres being dipped into bowls of liquid chocolate with a decorating fork. Moulded chocolate is less liquid. It is run into moulds, shaken mechanically, and knocked out (in form of blocks, bars, sticks, etc.) when cool and set hard. Fruit (e.g. raisins) and nuts (whole or chopped) can be mixed in before moulding.

Milk chocolate is made with dried powdered milk or with fresh liquid milk. In the latter case, partially evaporated milk is mixed with chocolate mass and sugar. Factories for this purpose have been estab. in dairy dists., and the partially finished product ('crumb') is sent to the parent factory for the final stages of manuf.

By-products. Apart from cocoa butter, by-products of the industry are cocoa shell, a constituent of some cattle foods, and the drug theobromine, a useful stimulant.

Constituents and food value. Cocoa nib consists typically of 55-56 per cent fats, 25 per cent carbohydrates, 12 per cent proteins, and the balance of salts, iron, etc., yielding 2975 calories per lb. A good brand of plain eating chocolate is composed of 32 per cent fat, 60 per cent carbohydrates, and 5 per cent proteins (= 2500 calories per lb.); milk chocolate made with fresh milk of 37 per cent fat, 54 per cent carbohydrates, and 9 per cent proteins (= 2600 calories per lb.), while cocoa powder has about 28 per cent fat, 34 per cent carbohydrates, 18 per cent proteins, and 20 per cent other constituents (= 2100 calories per lb.).

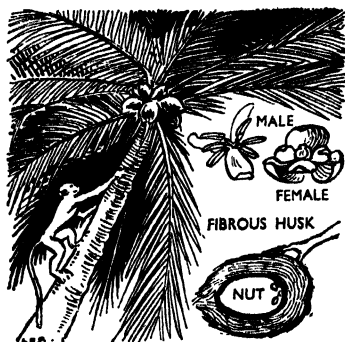
History. Cocoa beans were first brought to Europe in 1494 by Columbus, but he did not realise their value. Cortez, who conquered Mexico in 1519, noted the use which the Aztecs of Mexico made of cocoa beans, and he introduced chocolate as a beverage into Spain. Cortez found that the Aztecs, believing that it was a gift to man from the gods, consumed large quantities of a preparation made from the roasted and ground bean called *chocolatl*. Montezuma, the Aztec emperor, and his court were said to use 50 jars a day. It was beaten to a paste, flavoured with spices, and taken cold. For a cent. Spain kept secret the recipe for chocolate, but France learned it and knowledge of chocolate spread thence to other countries. In 1637 a Frenchman opened a 'chocolate house' in Bishopsgate, London. During the latter half of the 17th cent. chocolate houses sprang up all over London and became resorts of politicians, wits, gamblers, and literati. At one, White's in St James's Street, a centre for reckless gambling was founded the first club (see CLUBS). High import duties were imposed on cocoa beans. It was not till 1853 that, by imposition of a uniform penny a pound on imported colonial and foreign beans, price was brought within

reach of less well-to-do. Fry's are the oldest C. and C. firm in the world, having developed from a small concern estab. in 1728. When chocolate as a sweetmeat was introduced is not certainly known, but as late as 1842 a leading Eng. manufacturer listed only one 'line' of eating chocolate. Modern drinking cocoa was invented about 1828 by van Houten, the Dutch maker, who expressed part of cocoa butter, but it was not until the 1860's that it was introduced into England by Cadbury's. Hitherto cocoa had been mixed with farinaceous substances in order to counter-balance high fat content. The new process of making cocoa by creating a supply of cocoa butter enabled more palatable eating chocolate to be made. Sir Hans Sloane prepared a milk chocolate for drinking in the late 18th cent. Peter, the Swiss maker, introduced milk chocolate for eating in 1876.

See A. W. Knapp, *Cocoa and Chocolate: their History from Plantation to Consumer* (with bibliography), 1920; *The Cocoa and Chocolate Industry: the Tree; the Bean; the Beverage*, 1930; and *Cacao Fermentation* (London), 1938; R. Whymper, *Cocoa and Chocolate—their Chemistry and Manufacture*, 1921; H. W. Bywaters, *Modern Methods of Cocoa and Chocolate Manufacture*, 1930; H. C. J. Wynoogst, *Hints for Cocoa and Chocolate Manufacture* (Copenhagen), 1938; C. T. Williams, *Chocolate and Confectionery*, 1950; D. H. Urquhart, *Cocoa*, 1955.

Coconut, fruit of a species of palm (*Cocos nucifera*) found in most tropical regions, and reaching perfection in a sandy soil near the sea. It is found on even the smallest is. of the Pacific, the nuts being admirably adapted for distribution by ocean currents, and germinating readily when cast up on shore. The tree grows to a height of 60-100 ft. and consists of a cylindrical stem 1½-2 ft thick, marked with rings where leaves have formerly grown, and terminating in a crown of from 16 to 20 graceful pinnate leaves, each about 15 ft long. These consist of a strong central rib, on both sides of which are numerous long thin leaflets. The flowers grow in branching spikes, 5-6 ft long, enclosed in a spathe, and each of these produces from 5 to 15 fruits. Each fruit consists of a thick husk of brownish fibres, called coir, with a hard inner shell containing a white kernel, which in turn encloses a 'milky' liquid. The tree begins to bear at 7 or 8 years of age, and continues to produce 4 or 5 crops a year for 70 or 80 years. Its uses to the natives of the regions where it grows are numberless. The nut, in various stages, is a standard article of food, and the milk forms an agreeable drink. The root is sometimes chewed as a narcotic; the young terminal bud, palm cabbage, is a delicious vegetable; the sap, in various stages of fermentation, forms toddy, palm wine, and arrack, and is boiled down to form a sugar known as jaggery. The leaves serve as thatch, and are plaited for mats and baskets; the trunk supplies a valuable timber known as porcupine wood; and the coir, or outer husk, is made

into ropes, cordage, etc. The kernel is by far the most important product, due to the large proportion of oil that it contains and the consequent high demand for it in the country of production and in Europe and N. America. When suitably dried it is termed 'copra'; it is about a quarter of the weight of the original nut without husk and contains up to 70 per cent of oil. Continuous screw presses (expellers) and, to a lesser extent, hydraulic presses are used for expression of the oil, which is used for edible purposes and in the manuf. of soap, while the cake residue, containing about 6 per cent of oil, is used in animal feeding stuffs. World production of copra is almost 3,000,000 tons per year, of which about 80 per cent



COCONUT

is produced in the Philippine Is., Indonesia, Ceylon, India, Malaya, and New Guinea. Approximately half is exported, chiefly to W. Europe. The Philippine Is. are the main exporters, followed by Indonesia, and together they provide over 70 per cent of world copra exports. Almost the whole of production in India (about 180,000 tons) is consumed locally (see COCONUT OIL).

Desiccated coconut is manuf. in Ceylon, America, and Europe by drying the meat of the C. after the rind has been removed; it contains 68-70 per cent of oil.

Coconut Beetle, or *Batocera rubus*, species of Cerambycidae found in the E. The larvae do much damage by eating the young coconut trees, and are themselves eaten by the natives.

Coconut Oil, or **Coconut Butter**, one of the most important of the lauric acid oils, is derived from the fruit of the palm *Cocos nucifera* and constitutes up to 70 per cent of the dried kernel, known as 'copra.' Extraction of the oil is by pressing in continuous screw presses (expellers) and, to a lesser extent, in hydraulic presses (see OILSEEDS, PROCESSING OF). It refines to a colourless oil with neither taste nor odour and sets to a white fat when cooled below about 24° C. Main component fatty acids are

—saturated: Lauric (44-55 per cent), Myristic (13-19 per cent), Palmitic (7-11 per cent), Capric (4-10 per cent); and unsaturated: Oleic (5-8 per cent). C. O. differs from most vegetable oils in that it has a narrow plastic range—it passes from solid to liquid within a temp. range of a relatively few degrees and, due to the low proportion of unsaturated fatty acids, can be changed but little in melting-point and consistency by hydrogenation. These characteristics limit the use of the natural and hardened oils in edible products, but considerable quantities are used in the manuf. of margarine and help to produce a consistency similar to that of butter, which also has a comparatively short melting range. Large quantities of C. O. are separated into 2 fractions—'stearine' and 'oleine'—by hydraulic pressing, and the hard 'stearine' is used in the manuf. of chocolate and special cooking fats, and for pharmaceutical purposes, while the liquid 'oleine' is used as a baking fat for biscuits, cakes, etc., in the production of confectionery such as toffee and caramels, and in salad dressings. The crude oil is also processed for use in solid soaps as a minor constituent to impart foaming, and in liquid soaps and shampoos because of the solubility of the potassium soaps of its acids. A small quantity of the oil or fatty acids obtained from the soap stock resulting from alkali-refining is used to make non-drying alkyds for use as plasticising resins, particularly in the U.S.A.

Cocoon (from Lat. *concha*, shell), pupa-case of many insects, especially of moths and silk-worms. This outer web or ball is spun from the mouth by caterpillars before passing into the chrysalis state. Originally the word was only applied to the C. spun by the silk-worm (*Bombyx*). It is now extended to all similar structures (e.g. silken case spun by spiders to receive their eggs). The pupal stage may last a long or only a short time, the covering splitting when the insect is ready to emerge.

Cocos, genus of tropical palms now botanically of one species, *C. nucifera*, the coco-nut palm. See COCO-NUT.

Cocos Islands, see KEELING.

Cocteau, Jean (1891-), Fr. dramatist, novelist, and poet. b. Maisons-Laffitte. He possesses an amazing versatility, and has thrown himself into every new movement in the artistic world of France, drawing upon the new artists and musicians like Picasso, Erik Satie, and Darius Milhaud to collaborate with him in the production of ballets like his famous *Le Boeuf sur le toit*, 1920, and *Les Mariés de la Tour Eiffel*, 1921. His dramas include *Orphée*, 1927, *Antigone*, 1928, *La Machine infernale*, 1935, *Les Parents terribles*, 1938, and *L'Aigle à deux têtes*, 1946. He has also won success as a novelist with *Le Grand Écart* and *Thomas l'imposteur*, both 1923, *Les Enfants terribles*, 1929, and *Le Journal d'un inconnu*, 1953, and has written and directed sev. well-known films, including *Le Sang d'un poète*, *L'Éternel Retour*, and *Orphée*. Among his verse is *L'Ode à Picasso*, 1919, *Poésies*,

1920 and 1948, *Mythologie*, 1934, and *Clair-Obscur*, 1955. His books of criticism—*Carte blanche*, *Le Coq et l'arlequin*, and *Le Secret professionnel*—have become guide-books for the younger writers. In 1955 C. was elected a member of the Académie Française. He painted the interior of the St Pierre Chapel at Villefranche in 1957. See R. Lannes, *Jean Cocteau*, 1945; C. Mauriac, *Jean Cocteau, ou la vérité du mensonge*, 1945; M. Crossland, *Jean Cocteau*, London, 1955.



French Embassy

JEAN COCTEAU ON THE OCCASION OF HIS ELECTION AS A MEMBER OF THE ACADEMIE FRANÇAISE

Cocumilia, name of a kind of plum found wild in Calabria. It has the reputation of being a powerful febrifuge, and the bark is much used for the cure of intermittent fevers.

Cocx, Gonzales, see COQUES.

Cocytus (modern *Vuvu*), riv. of Epirus, trib. of the Acheron, which flows into the Ionian Sea, 20 m. N. of the Gulf of Arta. In Gk mythology it was held to be one of the rivs. of Hades, and the name, which means wailing, refers to the cries of the dead. Hence Milton's 'Cocytus named of lamentation loud.'

C.O.D., see CASH ON DELIVERY SYSTEM.

Cod, or *Gadus callarias*, important species of bony fish in the same genus as the haddock, whiting, and pollack. Other representatives of the family Gadidae are

the ling and coal-fish, but the C. surpasses all these in economic importance; as a food it is much valued, and C.-liver oil is of great repute in medicine. The body is generally of a dark grey hue, is elongated in form, and covered with small, soft scales, while a small barbel depends from the chin. It inhabits the neritic parts of the sea, and at the bottom feeds on such animals as crabs, molluscs, worms, herrings, and a few members of its own family. It is the largest of the Gadidae, attaining a length of 4-5 ft and weighing as much as 100 lb. The C. is found in the temperate regions of the N. hemisphere, along the N. European coasts, not farther S. than Gibraltar, and on the Amer. coast, the fisheries off Newfoundland being especially famous. Other C. fisheries are those of the Lofoten Isles off the N. coast of Norway and off Greenland, Spitsbergen, and Bear Is. It spawns in the early part of the year between Feb. and April, and is very prolific, 1 fish producing as many as 8 or 9 million eggs. Of these, however, very few are ever fertilised, and the young C. are quite small, being less than an inch long when first produced. C. fishing was an important industry 5 or 6 cents. ago, and was carried on by people of various nationalities, among them French and English, on the shores of N. Europe and Iceland. The C. are caught principally by trawls and lines and bait, long lines and hand lines both being employed. A large quantity of the C. caught off Newfoundland is dried and salted, and is then exported—a considerable amount—to the countries of S. Europe. In addition to this the fish furnishes other useful products, isinglass being obtained from the air-bladder, and cod-liver oil, as mentioned above, from the liver, this oil being used largely as a medicine for lung complaints. In some parts the heads are used as a food for cattle, and the roe alone is used for human food. See FISHERIES.

Cod, Cape, see CAPE COD.

Cod-liver Oil, marine oil extracted from the liver of the cod-fish (*Gadus morrhua*). It is sometimes, however, adulterated with oil from the ling or turbot, but the latter are not officially recognised. The chief exporting countries are Norway and Newfoundland, the former utilising fish from the N. Sea and the latter those of the Newfoundland banks. The processes of manuf. have improved greatly of recent years, and, in place of the old coloured and disagreeable fluid the best medicinal varieties are almost colourless and tasteless. Healthy and fresh cod livers are taken and placed in barrels and the exuding oil ladled out. Gentle heating brings out more oil. These products, however, are not equal in value to that obtained in the next process, which consists in leaving the livers in rooms with freezing mixtures, when the oil which remains unfrozen is taken off and constitutes the best variety of oil. A coarse variety is next obtained by boiling down the remains of the livers. It is of dark brown colour and is used for treating leather. In the operation of stuffing,

dubbin (a mixture of tallow and C. O.) is rubbed into the leather to make it waterproof and supple. C. O. is valuable as a food and as a source of vitamins A and D (see VITAMINS). For this reason it is given in cases of tuberculosis (q.v.) and as a supplementary food for infants and young children. Attention has recently been called to certain risks attendant upon overdosage with vitamin D, and as a result manufacturers will in future reduce the average content of vitamin D in C. O. from 200 international units per gramme to 100. It is easily digested, especially when in the form of an emulsion—that is, in small globules. This is probably due to the existence of free oleic acid to the extent of about 5 per cent, which is a good emulsive agent. There are also olein (80 per cent) and palmitin and stearine, which are valuable glycerides. Doses should begin in small quantities of a teaspoonful and gradually increase to a tablespoonful.

Codea (Lat. *cauda*, a tail, through It.), in music, a term applied to a passage concluding a composition or one movement of it, especially in sonata form. It was developed, notably by Beethoven, into an important and elaborate feature of a composition.

Code, see CODES AND CODIFICATION OF LAW.

Code Napoléon, or the Civil Code of Fr. law. The term C. N. was suppressed in 1814, but re-established in 1852 out of respect for Napoleon's memory. Since 1870 the name Code Civil has come into general use. Before the revolution there existed no unified system of laws, and France was divided between the *droit coutumier* in the N. and the *droit écrit* in the S., based on Rom. law. Under the Fr. constitutions of 1791 and 1793 it was promised to codify the laws, but it was not until Napoleon became First Consul that 3 commissions were set up in 1800–2 to codify the laws under 5 heads, of which the first is the Code Civil or C. N. Three jurists—Tronchet, Portalis, and Bigot—were entrusted with the task of drafting the code, and, being from the N., they drew largely upon the *droit coutumier*, but some sections of Rom. law were incorporated. The first 14 laws were passed by the Assemblies in 1803 and the remaining 22 in 1804. The third and authoritative ed. of the C. N., still in force, appeared in 1816. Napoleon is said to have been prouder of the C. N. than of his many victories. The code is clearly expressed in a straightforward style and is well arranged. It is divided into 3 books preceded by a preface. Book I (articles 7–515) is concerned with persons, and is subdivided into 11 sections, which deal with the distinctions between Frenchmen and foreigners, with civil domicile and with absence, with marriage and divorce, with paternity, adoption, and paternal authority, and with minority and majority. Book II (articles 516–710) is divided into 4 sections, concerned with classification of property, with ownership, usufruct, and easements. Book III (articles 711–2281) details the different ways ownership may be acquired. It has 20 sections,

which come under 7 main heads: successions; gifts *inter vivos* and wills; the theory of contracts or obligations; the marriage contract; other contracts (sale, hire, loan, bail, etc.); priorities and mortgages; and prescriptions. The C. N. has been trans. into English by E. Blackwood Wright and others. See CODES.

Codeia, or **Codaine** ($C_{17}H_{17}ON(OCH_3) \cdot OH$), alkaloid forming 0.3 per cent of opium. It is identical with *methylmorphine*, and resembles morphine in its hypnotic effects. It is obtained, in orthorhombic colourless crystals, with 1 molecule of water of crystallisation. It is insoluble in alkalis, but dissolves readily in alcohol, ether, and chloroform. In medicine C. is used as a soporific, but, like morphine, it must be employed with caution and only under the supervision of a medical man. It is used to allay the irritation causing cough when a paroxysm is likely to prove dangerous, and has been employed to this end in whooping cough. It is useful also in *diabetes mellitus* where it tends to prevent the excretion of sugar.

Codes and Codification of Law. Code is a term denoting a collection of laws. Codification is the process of classifying laws or reducing them to a system or digest. Various codes have been prepared either as a systematic statement of existing laws in a form available for easy reference or as the basis of study of a legal system. In ancient times the existence of a code indicated a matured stage in the development of a society. Codification does not necessarily mean that a legal system is static; it may be modified from time to time to meet the changing requirements of the society for which it is designed. Justinian, for example, within 30 years, added 165 *novellæ* (new laws) to his code of Rom. law. Codes such as the Moraic and Islamic laws, which are credited with a divine origin, are compilations of immutable laws. The empiricism of the Eng. common law has not lent itself to codification, which has been largely confined to the tidying of the statute book to make statute law on give topics more easily accessible (see CONSOLIDATION OF STATUTES).

Examples of codes and codification of law. (1) The Theodorium code, which was modelled on the earlier and private collections compiled by the jurists Gregorianus and Hermogenianus, was a digest of the constitutions (decisions) of the emperors from the time of Constantine. (2) Justinian's first code (AD 529) was founded on that of Theodosius, whilst the second was a revision of the first with the addition of a book of 60 decisions (AD 534). (3) Rom. law inspired many codes, e.g. the Romano-Barbarian codes—Edictum Theodorici, the Breviarium Alaricanum (q.v.), and the Lex Burgundionum (Fr. Loi Gombette). The influence of the breviary of Alaric, according to Prof. Muirhead, was so great in Europe that until the 12th cent. it was from it rather than from Justinian's code that W. Europe acquired the knowledge of Rom. law. (4) The Code Frédéric was framed as a common system in place of sev.

systems rather than to restate in exact and exhaustive form the whole of the existing laws. It was intended to make law knowable to all and purported to explain the Rom. law, Saxon law, and other foreign subsidiary laws and statutes. The lack of homogeneity between the various Germanic states is explained by the fact that their prov. laws were left unimpaired. (5) The Code Napoléon (q.v.), 1803-4, despite the hasty compilation, has served as a model in sev. European states. It was largely based on the civil or Rom. law and, according to the 19th-cent. Eng. jurist Austin, was never intended to supersede all other law but to be supplemented by anct customs and general principles of law and equity. It consisted of the Code Civil, Code de Commerce, Code Penal, Code d'Instruction Criminelle, and various procedural codes. (6) The code of the state of New York purported to be an exhaustive restatement of laws and affected to provide 'for every possible case, so that when a new case arises it is better that it should be provided for by new legislation.' (7) Comprehensive codes have not been adopted in England. In India, however, Stephen's Indian Evidence Act (see EVIDENCE) and the Penal Code drafted by Macaulay appear to have worked well. The principles underlying these codes are presented in a concrete form by many practical illustrations.

The arguments for and against codification as analysed by the Eng. jurist Austin may be summarised as follows: (1) A code cannot be so comprehensive as to anticipate every conceivable legal situation. This is, however, not the object of codes, which do not preclude the elasticity of laws in order to meet the changing social needs. (2) A code may give rise to inconsistencies in its failure to legislate for every possible contingency. Any statute law is liable to create inconsistencies and the courts are often called upon to decide in favour of one of sev. conflicting principles. (3) In reply to the alleged failure of the Fr. and Prussian codes, Austin states that these were prepared hurriedly and are not fair examples of what codes might be. He explains that the Code Napoléon lacked scientific precision and, like the Rom. codes, contained an unsystematic juxtaposition of principles, maxims, and philosophical speculation. Despite these defects, it is the basis of the legal systems of most Lat. races. (4) Austin favoured codification, which he thought, however, was a question of time and place. Bentham, the great 19th-cent. reformer, suggested codes which were too Utopian to secure support. The only argument in favour of codification among Eng. lawyers is to make the law as coherent and concise as possible. The Ger. code was inspired by a desire for national unity, whereas the Code Napoléon epitomised a hatred of the *ancien régime*.

Codex Argenteus, see ARGENTEUS.

Codex Bezae, see BEZA, THEODORE.

Codex Sinaiticus, see SINAITICUS, CODEX.

Codex Vercellensis, see VERCELLI BOOK.

Codicil, writing by way of supplement to a will, and which is to be considered part of it, whether for the purpose of explaining, altering, or adding to the provisions of the will. In the Rom. law C.s were small tablets on which memoranda or letters were written, giving directions to the heir, especially in regard to creating *fidei commissata* or trusts. By the Rom. law a testator could not alter his will unless he made an entirely new one. Hence the utility of C.s, which in Rom. law could be made whether there were a will or not. Such C. differed from the Eng. C., therefore, in that it did not mean a supplement to a will, but obligatory directions by tablets. Where a Rom. C. was confirmed by testament, it was operative to give legacies as well as to create *fidei commissata*. Rom. C.s had to be made in the presence of 5 witnesses. In Eng. law a will when once signed and attested cannot be altered without being re-executed except by a C. The execution of a C. operates as the re-execution of the will, and hence a C. duly executed as a will, will render a will which was not duly executed valid, provided the C. clearly refers to the will. Where a will is revoked by actual destruction, no C. can revive it. A C. forms part of the will, and is incorporated with it in the probate. If in any way inconsistent with the will, the C. prevails. A C. must be executed with the formalities of a will, that is, signed in the presence of 2 witnesses. See WILL.

Codigoro, lt. tn in Emilia-Romagna (q.v.), 22 m. E. of Ferrara (q.v.). It is 8 m. from the Adriatic coast, and the dist., formerly marshy, is very productive. Pop. 15,000.

Codogno, lt. tn in Lombardy (q.v.), 32 m. S.E. of Milan (q.v.). It manufs. silks and the cheese known as Parmesan. Pop. 12,000.

Codreanu, see JORGA and RUMANIA, History.

Codrington, Christopher (1668-1710), Eng. soldier and scholar, commonly called **Codrington of All Souls**, son of Christopher C., a captain-general of the Leeward Is., b. in St John, Barbados, and educ. at Enfield school and at Christ Church, Oxford. He became a fellow of All Souls in 1690; in 1694 he served with William III in Flanders and, fighting with distinction at Huy and Namur, was made captain of the 1st regiment of foot guards by the king. Though C. gained the reputation of a wit and scholar it is as a W. India governor and captain-general that he is remembered. In 1697 the king made him captain-general and commander-in-chief of the Leeward Is. in succession to his father. He resigned after the failure of his Guadeloupe expedition (1703) and lived in retirement, studying Church hist. at his estab. in Barbados. In his will he left a large legacy in cash and books to All Souls College. He left his Barbadian estates to the Society for Propagation of the Gospel for the foundation of a college in Barbados now known as C. College. See V. T. Harlow, *Christopher Codrington, 1668-1710*, 1928.

Codrington, Sir Edward (1770-1851), admiral, *b.* Dodington, Glos., and entered the navy in 1793. At Trafalgar (1805) he commanded the *Orion*, and subsequently took part in the Walcheren expedition. Rear-admiral in 1814, he led the fleet at Washington and Baltimore in the Amer. war. In 1826 he commanded the combined fleets of Great Britain, France, and Russia at the battle of Navarino, in which he destroyed the Turkish Navy, but was held to have exceeded orders and recalled. He became admiral of the Red in 1837, and in 1839 was appointed commander-in-chief at Portsmouth.

Codrington, Sir William John (1804-1884), general, second son of Sir Edward C. (q.v.). During the Crimean War he distinguished himself at Alma and Inkerman, and in 1855 became commander-in-chief at Sevastopol. M.P., 1857. Governor of Gibraltar, 1859-65.

Codroipo, It. tn in Friuli-Venezia Giulia (q.v.), 15 m. SW. of Udine (q.v.). Pop. 8000.

Codrus, son of Melanthus, and the last King of Athens. He lived about the 11th cent. BC. When the Dorians had invaded Attica he is supposed to have acted on the advice of the oracle, and to have given his life for his country.

Cody, Samuel Franklin (1862-1913) ('Colonel Cody'), aviator and inventor of a triplane, *b.* Birdville, Texas. He was a pioneer aviator in England (he became a naturalised Brit. subject) and made the first official powered aeroplane flight in England in 1908 at Farnborough, where he was employed by what is to-day called the Royal Aircraft Estab. He was killed in an aeroplane crash near Aldershot.

Cody, William Frederick (1846-1917), famous all over the world as Buffalo Bill, and one of the last of the picturesque figures of the far W. in the U.S.A. before it became a settled agric. country: *b.* Scott co., Iowa, U.S.A. In the days before the great transcontinental railways were built across the prairies and through the mts to the Pacific coast, C. became noted in the sixties as one of the chief riders for the famous Pony Express. This was organised by a company which undertook to forward the U.S. mails from St Joseph, Missouri, to Sacramento, California, by means of intrepid men who rode relays of ponies through country often dangerous because of hostile Indians. Upon the outbreak of the Civil war, C. became one of the most skilful scouts and guides for the N. troops operating in the middle W. Upon the close of the war, when Congress gave huge land grants to companies undertaking to construct railway lines to the Pacific coast, C. obtained the contract to supply the railway workmen who were laying the lines with fresh supplies of buffalo meat. The buffalo, or more correctly the bison, then roamed the prairie lands in thousands. It is recorded that C. killed 4820 bison in 18 months. Ever afterwards he was known as Buffalo Bill. After that he again served his country in the wars against various Indian tribes. Then, looking around for fresh fields to conquer,

C. recalled that the youth of 2 continents had been fascinated by tales regarding the Indians, the cowboys, and the trials of settlers who were attacked by the red men. He gathered together a band of cowboys, who were expert riders and lasso-throwers, and also secured a large number of Indians of various tribes through arrangements with the U.S. Gov. This was the beginning of his famous travelling entertainment, Buffalo Bill's Wild West Show. It was an enormous success in the E. states of the U.S.A. C. then took the huge organisation to England and to the leading countries of Europe, and repeated his success, the show being different from anything ever offered in the Old World.

Co-education, education of the 2 sexes together in school or college. The term mixed education should be used to describe schools where boys and girls are taught under the same roof, and occasionally together, purely from motives of convenience, and C. reserved for those schools which offer a genuinely shared upbringing, as far as may be, both in and out of the classroom, from a belief in its value as a training in mutual understanding and help, and as a basis for a right adult relationship between the sexes. This latter method has been practised only rarely in the hist. of European education; though it had the strong support of Plato, it finds little or no mention in the pages of the classical educationists, Quintilian, Elyot, Ascham, Milton, Locke, Rousseau, Pestalozzi, Herbart, Froebel, and Spencer. Yet, historically speaking, segregated education may be held to be an accident: most schools were founded at a time when education was thought unnecessary or even improper for girls. C. was very rare in the ant. world; the spread of Christianity fostered it, and the pioneer court schools of Charlemagne (AD 782) and Alfred the Great (c. AD 900) were co-educational, as was the famous Renaissance school of Vittorina da Feltré at Mantua (1423). The 'new' humane education of the 19th cent., deriving largely from the theories of such writers as Luther, Rabelais, Malcaster, Rousseau, Pestalozzi, and Froebel, and protesting against narrowness of curriculum and brutality of treatment, was theoretically favourable to C., but its development (dating in England from the sixties) has been very gradual. Bedales, founded by J. H. Badley in 1893, was the earliest whole-hearted co-educational boarding school. Statistics of co-educational practice in different countries are apt to be misleading, since much C. is only mixed; broadly speaking, C. is strongest where the prevailing religious obedience is Protestant or the form of gov. democratic (e.g. all the Scandinavian countries, the U.S.A., and—an interesting exception—Portugal), weakest in Catholic or authoritarian countries (e.g. Rep. of Ireland, Spain, France, the U.S.S.R.). In England the proportion of mixed state secondary schools (mixed primary education is everywhere normal) is 27 per cent, and among recognised private secondary

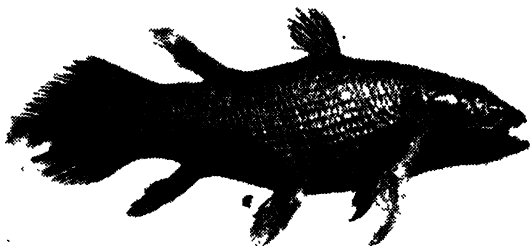
schools 27 per cent also; but almost all the numerous unrecognised private schools are segregational. All branches of univ. education now practise C. in a greater or lesser degree, as did the first univ., Plato's Academy; but the number of women students in the U.K. univs. is very much smaller than the number of men. See B. A. Howard, *The Mixed School*, 1928.

Coefficient, in algebra, denotes the numerical quantity preceding an algebraic term and by which the term is to be multiplied. It is also used to denote the ratio of the increase or decrease of any quantity with a change in a variable quantity which determines its condition. Thus the linear C. of expansion of any material with temp. denotes the increase

teca di Fortificazione, 1810, and Bonomer, *Essai général de Fortification*, 1814.

Coehorn, small bronze mortar invented by Menno van C., the engineer, and named after him.

Coelacanth, group of specialised cross-opterygian fishes (q.v.) characterised by lobate fins which could be used more or less as limbs, a symmetrical diphycceral tail, and a hollow cartilaginous 'backbone' bearing hollow spines (hence the name). C. occur as fossils in rocks as far back as the Upper Devonian (300 million years old); they were abundant in Triassic times, and were thought to have become extinct in the Cretaceous period, some 50 million years ago. However, in 1938, a 5-ft steely-blue coelacanth



By permission of Prof. J. L. B. Smith
and Longmans, Green & Co. Ltd

LATIMERIA, A MODERN COELACANTH

in length per unit length for one degree rise in temp. We may also regard it as the quantity by which the length of the material must be multiplied to give its expansion for one degree rise of temp. Similar C.s are the C. of pressure, viscosity, volume, etc. Of course the value of a C. will depend on the unit employed in the independent variable.

Coehorn, or **Coehoorn**, **Menno**, **Baron van** (1641-1704), Dutch engineer. He inherited from his father a taste for military learning. During the Seven Years War his bravery at Maastricht and Seneffe, and the works of defence which he had constructed, made him famous. In 1673, at the siege of Grave, he used a mortar of his own invention. After peace had been declared in 1678 C. devoted his time to engineering work, and fortified many towns in Holland. When war began again he was to the front, as before, and met Vauban at the siege of Namur, where he had to surrender—but he was present at its recapture, and later on was made lieutenant-general. He commanded a corps in Marlborough's army, 1701-3. D. suddenly of apoplexy. For a description and critical appraisal of his engineering theories, see Marini, *Biblio-*

weighing 127 lb. was caught off E. London, Cape Province, and named *Latimeria chalumnae*. A second specimen was caught off the Anjouan Is. in the Comoro archipelago, near Madagascar, in 1952, and named *Malania anjouanensis*. Both specimens probably belong to the same genus, the former being the valid name. Sev. more C. have subsequently been captured off the Comoro Is., including an egg-bearing female. Their interest is centred on the unexpected survival into modern times of an apparently extinct line, and the valuable information they provide concerning the structure of cross-opterygians. See also *LATIMERIA*. See J. L. B. Smith, *Old Fourlegs, The Story of the Coelacanth*, 1956.

Coelenterata (Gk *koilos*, hollow; *enteron*, alimentary canal), name of a large phylum of invertebrate animals, differing greatly in both structure and habit. All are aquatic, and the great majority are marine. A very general feature is the presence of stinging cells, and nearly all the coelenterates are radially symmetrical. The nervous and vascular systems are absent or rudimentary, and the body wall consists of an inner and outer layer of cells, called respectively the endoderm

and ectoderm. Within the body wall a single cavity (enteron) communicates with the exterior through a single opening. Reproduction is often sexual, but vegetative multiplication by budding and fission is also common. Both medusoid and polypoid types occur in the C., and in the latter a limy skeleton is frequently developed, and thus forms a coral. The group is divided into 3 classes, the Hydrozoa, Scyphozoa, and Anthozoa (or Actinozoa). The first class is represented by many well-known animals, e.g. the freshwater *Hydra* (q.v.), sev. corals and small jellyfishes, and the Portuguese man-of-war. The second contains the large jellyfishes often cast up on Brit. shores or found floating in the water, and dreaded by bathers on account of their stinging powers. The third class includes the sea anemones, dead men's fingers, and other corals. The Ctenophora, e.g. *Beroë* and *Cydippe*, are regarded by many zoologists as a div. of the coelenterates, while others regard them as belonging to a separate phylum. The species are very widely distributed, some are free-swimming, others are sessile, and a few are parasitic. Small organisms constitute the greater part of their diet, and in obtaining their food the stinging organs are frequently called into action.

Coelestinus, see CELESTINE.

Coele-Syria (modern El Buk'a Beka'a, or Bika), valley of Lebanon, between the ranges of Lebanon and Anti-Lebanon. Altitude 2600-3000 ft; length about 100 m. Through it flow parts of the Nahr-el-Litani (anc. Leontes) and the Nahr-el-Asi (anc. Orontes). Called Hamath in the O.T.

Coeelho, Francisco Adolfo (1847-1919), Portuguese philologist, noted for his research on Portuguese language, folklore, and onomasticon. He pub. *A Língua Portuguesa*, 1868, *Origem da Língua Portuguesa*, 1870, *Algumas observações acerca do Dicionário Bibliográfico Português*, 1870, *Tratado de pronúncia Francesa*, 1875, *Contos populares Portugueses*, 1879, *Antologia de poetas e prosadores*, 1885, *Noções elementares de gramática Portuguesa*, 1891, *Os ciganos em Portugal*, 1892, *Diferenças fonéticas das línguas*, 1900-1901, *Estudos sobre a influência étnica na transformação das línguas*, 1901, and *Cursos de analogia da língua Portuguesa*, 1907.

Caelius Antipater, Lucius (2nd cent. BC), Rom. lawyer and historian. He was the first who introduced an ornamental style into his writings, which were highly rhetorical. He wrote the hist. of the second Punic war, and Livy quotes from him. Surviving fragments are printed in H. Peter's *History of Roman Religion*; I (2nd ed.), 1914.

Coeilo, Claudio (c. 1630-93), Sp. painter, b. Madrid, who became painter to King Charles II. His masterpiece was 'Charles on his Knees among the Nobles of his Court' (the altarpiece for the sacristy in the Escorial representing the 'Transfer of the Eucharist'). When Luca Giordano was given a commission by the king, C. fell into a melancholy state, imagining

that his brother artist was preferred. Some of his best works are at Madrid and Salamanca.

Coeln (Köln), **Wilhelm von**, Ger. painter of the 14th cent. His chief works were mural paintings, the most important being in a chapel of Cologne Cathedral. There are also various other works in different picture galleries which are said to be his.

Coelomata (Gk *koilōma*, cavity), wide term, comprising all animals which possess a coelom, or body cavity lined with tissue derived from the middle germ layer or mesoblast. This tissue also invests the heart, alimentary canal, and other organs which are suspended in the coelom. Annelid worms, echinoderms, protochordates, and vertebrates are groups of animals in the well-developed coelomic cavities. In the arthropods and most molluscs the greater part of the body cavity (haemocoel) is associated with the vascular system.

Coelostat, see SIDEROSTAT.

Coemptio (joint-purchase), in Rom. law, a form of civil marriage, so called from the mutual fictitious sale of the 2 parties. The ceremony took place before 5 witnesses and a *libripens* (holder of the balance).

Coenobites, or **Cenobites** (Lat. *coenobita*; Gk *koinos*, common; *bios*, life), members of a religious order living a community life as opposed to hermits. See MONASTICISM.

Coenurus, now known to be merely the asexual stage in the life-hist. of certain Cestoda, or tapeworms, was formerly considered to be a distinct animal. This bladder-worm lives in an intermediate host which is eaten by a vertebrate before the parasite matures. *C. cerebralis* is the bladder-worm which is found in the brain of a sheep and gives rise to staggers, a disease which often works great havoc among a flock. *Taenia coenurus* occurs in the dog (see CESTODA).

Coerullignone, see CEDRINET.

Coesfeld, Ger. tn in the Land of N. Rhine-Westphalia (q.v.), near the Dutch border, 52 m. NNE. of Düsseldorf (q.v.). It received its charter in 1197, and it was a member of the Hansatic League (q.v.). There was severe damage during the Second World War. Textiles and paper are manuf. Pop. 15,000.

Coethen, see KÖTHEN.

Coeur, Jacques (c. 1395-1456), Fr. merchant and financier, b. Bourges. He inaugurated an extensive trade between France and the Levant. He was made the king's master of the mint, and from 1436 was in charge of the Fr. royal finances, advancing large sums to the king for carrying on his wars. C. amassed a huge fortune and founded colleges in Paris, Montpellier, and Bourges, and virtually controlled the trade of the whole country. The king seized the opportunity given by the sudden death of Agnes Sorel, the king's mistress, to accuse C., who had been appointed one of her executors, of having poisoned her. This and other allegations were without foundation, but C. was condemned to confiscation of his whole fortune. In 1455 he escaped to

Rome. According to some accounts Calixtus III put him in command of a fleet of galleys for the relief of Rhodes, but C. was taken ill at Chios and d. there.

Coffee, and **Coffee Trade** (Turkish *kahveh*, from Arabic *qahwah*, wine, the coffee beverage), beverage made from the roasted seeds of the C.-tree (*Coffea* species). Botanically there are 3 main types of C.: *arabica* (believed to have originated in Ethiopia but now yielding the bulk of the C. in the W. hemisphere), the more hardy *robusta* (a native of the Congo but widely grown elsewhere), and *liberica* (mainly from W. Africa). In international trade only 2 types are recognised: 'Brazils,' i.e. all those grown in Brazil regardless of type, and 'milds,' grown in other parts of the world. *Coffea arabica* has been introduced to very many

in rows. They are pruned to the same height, the ground being kept clear of weeds. Shade is needed, especially at first, and always in hot, dry climates, when irrigation is also necessary. The water supply should be lessened as the fruit ripens. Normally the first crop is yielded in the third year (amounting to as much as 2 lb. of seeds), and the trees live 40 years. In the W. Indies and Brazil 3 ann. gatherings are made. The beans are put on mats, dried by the sun, and often turned. They are passed between rollers to remove the dried pulp, freed from impurities, and put in bags for export. A wet method is also used extensively for *C. arabica*. The quality and price depend largely on the care expended in the process of preparation.

C. was unknown to the ancients and to the medieval world outside Ethiopia. It was not introduced even into Arabia until the 15th cent., and did not reach Europe for another 100 years. Rauwolf made it known to Europeans by an account of his travels, printed 1573. The plant was taken from Mocha to Batavia by Wieser, burgomaster of Amsterdam, in the 17th cent., and thence spread to Martinique (1720, from France), and has flourished in the W. Indies ever since. The chief different kinds of commerce are Mocha (from Arabia, with yellowy-brown beans), Java (with large yellow beans), Jamaica and E. Indian (with large blue-green beans), Surinam (which has the largest beans), and Bourbon (with pale yellowish-white beans). There are numerous ways of preparing C. for the table, the W. idea being to get the liquid free from all sediment by means of strainers of different kinds. The Turks drink their C. thick.

A number of cheaper substitutes are frequently used instead of C., or mixed with the ground berries, notably chicory root, dandelion root, cereal, carrot, yellow iris seeds, etc. The seeds of *Astragalus baeticus* are known on the Continent as Swedish C. All these lack the chief constituent, caffeine, and are much inferior (see ADULTERATION). Real C. is very refreshing, stimulating the system and diminishing the waste of tissues (see TEA). It is an antidote to opium or alcohol poisoning. Its 4 chief constituents are caffeine, volatile oil, caffeotannic and caffeic acids. The C. trade is very important, Brazil being by far the chief producer; over half of the world's ann. crop is produced in that country. C. is also largely exported from Mexico, Central America, Java, Sumatra, India, Ceylon, Arabia, Hawaii, and the W. Indies. A great deal of the C. consumed in Britain comes from E. Africa. Receipts from the customs on C. and cocoa are somewhat fluctuating, but show a marked decrease since 1927, the largest return being roughly £908,000. The consumption of C. per head in Great Britain and N. Ireland was over 2 lb. in 1950 and has increased during recent years. See G. C. W. Lock, *Coffee: its Culture and Commerce in all Countries*, 1888; W. H. Ukers, *All About Coffee*,



COFFEE

parts of America and Central Africa, and is now extensively cultivated in a belt about 25° N. and S. of the equator. The *Coffea* (*Coffea*) genus belongs to the family Cinchonaceae. When wild the tree is tall and slender with few branches, but the cultivated kind is pruned to a height not exceeding 6-10 ft. and trained in a pyramidal form with horizontal branches. The leaves are evergreen and shiny. They grow opposite, are leathery, and oblong in shape; the flowers are snow-white and small, clustered in the axils of the leaves, and very sweet-smelling. The ripe fruit is a dark scarlet colour, and contains 2 cells, each with a single seed. These seeds, called also C.-beans (from Arabic *bunn*, C.), C.-nibs, or C.-berries, are hard semi-ellipses. The *Coffea mauritiana* has bitter, slightly emetic seeds. The Liberian C.-plant of W. Africa seems more hardy than *C. arabica*, and better able to withstand the ravages of the leaf disease which proves so injurious to C. plantations. It flourishes in well-drained, sandy, or gravel soils, and on highlands, 1000-3000 ft above sea level. In Peru and Ecuador it is cultivated at a height of 6000 ft, but escapes frosts. C. plantations are usually laid out in quadrangles, 1-year-old trees, 12-16 in. high, being set

1922; J. H. McDonald, *Coffee Growing: with Special Reference to East Africa*, 1930; E. Windle, *Modern Coffee Planting*, 1933; H. E. Jacob, *The Saga of Coffee: the Biography of the Economic Product*, 1935.

Coffee-houses, first known in Cairo, were estab. in Constantinople during the latter part of the 16th cent., and are referred to in the writings of Burton (1621) and Bacon (1627). In the second half of the 17th cent. they were estab. in many European cities: Marseilles (1671), Hamburg (1679), Vienna (1683), Nuremberg (1686), Augsburg (1713). The first Eng. coffee-house was opened in Oxford in 1650 by a Jew named Jacobs, while the first London one dates from 1652, and was opened in St Michael's Alley, Cornhill, by a Ragusan, Pasqua Roscoe. They very speedily became extraordinarily popular and were much frequented. In 1675 Charles II attempted to suppress them as being the place of resort of the politically discontented. They served to a great extent as clubs. Among the most famous were Garraway's and Jonathan's, both in Change Alley, the former the scene of many a rash speculation during the time of the S. Sea Bubble, the latter, according to the *Taller*, 'the general mart of stock-jobbers'; Lloyd's; the Jerusalem, which also served as a news-room; Don Saltero's, with its attached museum of curiosities; Will's, which Dryden visited; the St James's, where the members of the Whig party met and Goldsmith originated his *Retaliation*; Button's, the favourite resort of Addison and Pope; and Tom's, in Birchin Lane, Cornhill, which Garrick frequented. At the present time cafés are merely eating-houses without licence for sale of intoxicants, and exist throughout the Brit. Isles. In France the *café chantant* is a kind of informal music-hall. See also RESTAURANT. See Aytoun Ellis, *The Penny Universities: a History of the Coffee-houses*, 1957.

Coffer, see CHEST.

Cofferdam, temporary structure erected on a river-bed or the bottom of a lake or the sea around an area where foundations for a pier or other structure are to be built. It usually consists of a double wall of piles, the space between being filled with clay puddle. The area surrounded by such a double wall can be kept effectively dry by light pumping to allow of building operations. When no longer required the piles are pulled up. In very calm water at shallow depth the piles may be dispensed with. In rivs. where obstructions must be kept to a minimum, closed grooved and tongued piling is used.

Coffering, in Rom. and Renaissance architecture, the treatment of a ceiling or of the underside of a vault or dome with deeply sunk rectangular panels known as 'coffers.'

Coffey's Still, apparatus for separating substances of different degrees of volatility from a liquid mixture. Different varieties of the C. S. are used in the spirit, ammonia, and coal-tar industries. In whisky distilleries the still consists of 1 or 2 vertical columns separated into chambers by perforated copper plates.

Steam is introduced at the base of one column and passes upwards through the perforations in the copper plates. The wash, or dilute alcohol, is introduced at the top of a column, is prevented from passing through the perforations by the pressure of the steam, and descends from chamber to chamber by means of a pipe, whose mouth stands slightly above the level of the copper plate. By this means the steam is kept in contact with the wash, and the more volatile constituents, including the alcohol, pass with the steam to the base of the cooling column, where they condense at different levels according to their boiling-points. At the level above which the alcohol condenses, the chamber floor is not perforated, so that the alcohol collects and is carried away by a special pipe. The still more volatile constituents are conducted to a water-cooling chamber. The strength and quality of the distillate are controlled by regulating the pressure of the steam and the rate at which the wash is pumped up to the analysing column.

Coffeyville, city of Montgomery co., Kansas, U.S.A., on the Verdigris R., 15 m. S. of Independence. It is the centre of a natural gas area, oil- and coal-fields, and manufs. structural steel and chemicals. Pop. 17,113.

Coffin (Lat. *cophinus*, basket or chest), receptacle in which dead bodies are buried. The earliest known use of C.s is in anct Egypt, where they were made of wood and stone. The Greeks and Romans seem to have used C.s in anct times, but later resorted to cremation. The Gk C.s were of various shapes, and usually made of baked clay; the Rom. *arcae*, or *loculi*, were frequently made of a limestone from the Troad, which was believed to have a corrosive action on the flesh (see SARCO-PHAGUS). The early Christians in Rome always buried their dead in C.s, which were either hewn out of the living rock or formed of sculptured stone. C.s appear to have been used by other European nations from prehistoric times. They have been found in Scandinavia, both of hollowed tree-trunks and of stone slabs lining the grave. In medieval times in England the lower classes seem to have simply buried their dead wrapped in a cloth; but the wealthier people employed tapering stone C.s and occasionally leaden ones. The light wooden C. now used is of recent origin.

Coff's Harbour, seaside tn in New S. Wales, Australia, 377 m. N. of Sydney by rail. Situated on the fertile N. coast, C. H. serves dists. growing bananas and timber, and raising dairy cattle. Pop. 6200.

Coggeshall, tn of Essex, England, on the R. Blackwater, 6 m. SE. of Braintree. Paycocke's House, a fine ornamented house (c. 1500), now belongs to the National Trust. C.'s manufs. include clothing and isinglass, and there is a seed-growing industry. Pop. 3000.

Cognac, Fr. tn, cap. of an arron., in the dept. of Charente, on the Charente. It has many anct buildings, including the castle in which Francis I (q.v.) was b.

C. is famous for its brandy. By Fr. law the name 'cognac' may be applied only to brandy produced within a strictly delimited area around C. Pop. 17,500.

Cognates (Lat. *cognatus*). In Rom. law C. were persons who were sprung from a common marriage, through either male or female antecedents, whereas agnates were persons related through males only. The foundation of C. was thus the legal marriage, while agnates were such persons as were under the same *paterfamilias*, or would be, were he still living. Those who were of the same blood by both parents were sometimes called *germani*; *consanguinei* were those that had a common father only, and *uterini* those that had a common mother only. In reckoning the nearness of C. reference is made to the common ancestor. Each generation is counted up to and including the common ancestor and thence down again along the other line, so that an uncle and a nephew are C. of the third degree, first cousins of the fourth degree, and so on. In Scots law C. are persons related through the mother, and agnates those related through the father.

Cogne, It. vil. in the Valle d'Aosta (q.v.). It is in the Graian Alps (q.v.), in the upper part of the Val di Cogne, and is opposite the Gran Paradiso (13,652 ft). C. is a popular resort (altitude 5032 ft), particularly for winter sports, and there are iron mines near by. Pop. 2000.

Cognisance, see BADGE and CREST.

Cognovit, obsolete plea by a defendant in an action at law which admitted the plaintiff's claim (*cognovit actionem*), thereby enabling him to obtain judgment without the necessity of a trial. At the present day the same result is attained by the simple process of signing judgment by consent.

Cohan, George Michael (1878-1942), Amer. playwright, actor, and songwriter. b. Providence, Rhode Is., son of Jerry John, actor. By his early twenties he was appearing on Broadway and writing plays in which he took the chief part. He acted in his own plays *Little Johnny Jones*, 1904-6, and *George Washington, Junior*, 1906-7. Other plays of his were *Forty-five Minutes from Broadway*, *The Talk of New York*, and *The Song and Dance Man*. He visited London, and among his comedies which were produced there were *Get-rich-quick Walkinford*, at the Queen's in 1913; *Broadway Jones*, at the Prince of Wales's, and *Seven Keys to Baldpate*, at the Apollo, in 1914; and *Baby Cyclone*, at the Lyric, in 1928. But he will probably be best remembered in Britain for the patriotic song *Over There*, which he wrote for the Americans in the First World War. In recognition of his patriotic service in composing that song and also the song *A Grand Old Flag*, Congress voted him a gold medal, which was presented to him by President Roosevelt at the White House in 1940. He wrote and composed hundreds of songs, many of which were known all over America and sung by millions.

Cohen, Ernst Julius (1869-1944), Dutch

(Jewish) chemist, b. Amsterdam. He studied under Arrhenius in Stockholm, Moissan in Paris, and van't Hoff in Amsterdam. In 1898 he was prof. of chem. at Montreal, in 1901 he was at the Amsterdam Univ.; in 1902 he succeeded the famous van't Hoff at Utrecht Univ. In 1899 he discovered that tin exists in 3 allotropic forms, confirming Aristotle. He pursued research into the allotropy of metals, and into piezochemistry. He also wrote *Jacobus Henricus van't Hoff, his Life and Work*, 1912.

Coherer, instrument used in early experiments on radio communication as detector. Loosely packed iron filings cohere, and thus become conducting, on the passage of electromagnetic waves. The C. was included in a battery-operated circuit with a bell or relay, acting as a switch which closed the circuit when waves impinging on the C. made it conducting.

Cohesion, molecular force which keeps the particles of a body together and resists rupture. It is strongest in solids, weaker in liquids, and almost insensible in gases. The forces of C. between atoms or molecules are electrical in origin. They are of various types: (i) Van der Waal's forces, proportional to $1d^7$ and negligible for separations (d) less than 10^{-7} cm.; (ii) ionic or electrostatic, proportional to $1d^2$; (iii) covalent; and (iv) metallic. C. of the particles of a solid body is due to the close contact brought about by the solidification from a liquid state, crystallisation out of solution, electrochemical deposition, etc. Great pressure will cause 2 similarly constituted bodies to cohere; but as it is necessary to force the surfaces to fit each other exactly, more force must be used than that which, exerted in a contrary direction, would cause a rupture. Two smooth surfaces of the same substance, however, can be made to cohere with but little pressure. *Adhesion* usually refers to the attraction existing between the surfaces of dissimilar substances. C. in a liquid means the attraction between the particles in the interior of the substance; the adhesive forces at the surface bounding a liquid and some other substances are dealt with in SURFACE TENSION and CAPILLARITY. See also R. Kronig, *Textbook of Physics*, 1954.

Cohn, Ferdinand Julius (1828-98), Ger. botanist, who improved the microscope, and with it made far-reaching discoveries as to the growth of plant and animal cells. He made a special study of lower algae and fungi. He contributed greatly to the overthrow of the doctrine of abiogenesis or spontaneous generation, and may be justly held to be the founder of bacteriology. He pub. sev. works on insect epidemics, infusoria, and plant diseases.

Cohoes, manufacturing in with water power from the falls of the Mohawk in the co. of Albany, New York, U.S.A. It is situated on the R. Hudson, on the Barge Canal, and possesses large cotton and woollen mills, and manufs. machines, pulp, and hosiery. Pop. 21,270.

Cohort, term used to denote a portion

of a legion in the Rom. army. Ten C.s made up a legion, which usually consisted of 6000 mon. The first C., sometimes numbering 1200, had charge of the standard of the legion. *See also* ROMAN ARMY.

Coif (Fr. *coiffe*, a cap), head covering of linen, in the shape of a close-fitting cap with a string under the chin like a modern baby's bonnet, which was worn by men through most of the 12th, 13th, and 14th cents. indoors and, beneath their usual headgear, outdoors. It went out of fashion in the 15th cent., but remained a part of the ceremonial dress of the Doge of Venice, and, in England, became a distinctive badge of office, first of councillors and ministers, and later of the serjeant-at-law. Upon wigs becoming commonly worn it was represented by a small black patch with a white border worn on the crown of the wig.

Coil, Electric, *see* ALTERNATING CURRENT; ARC-SUPPRESSION COIL; CHOKING-COIL; ELECTRIC MACHINES; INDUCTANCE; INDUCTION, ELECTRO-MAGNETIC.

Coimbra: 1. Dist. of W. central Portugal, mainly in Beira Litoral prov. (q.v.). It has a coastline on the Atlantic, and is drained by the R. Mondego. The dist. is generally low-lying and fertile, and has fishing, canning, textile, and salt industries. Area 1527 sq. m.; pop. 432,100.

2. City of Portugal, cap. of C. dist. and of Beira Litoral prov., built on a hill on the r. b. of the R. Mondego, 110 m. NNE. of Lisbon (q.v.). It was the cap. of Portugal 1139-1260, and is a bishopric. There is a fine Romanesque church, formerly the cathedral, and a notable 16th-cent. church, which has been the cathedral since 1772. The famous univ. of C. was founded at Lisbon in 1290 and was moved here in 1537. In the *Quinta das Lagrimas* (House of Tears) in the Santa Clara suburb Inez de Castro (q.v.) was murdered. There are textile and pottery manufs., and there is a trade in cereals, wine, and almonds. Pop. 42,650.

Coir, Sp. tn in the prov. of Málaga. It is in a dist. abounding in orchards, has textile and metal manufs., and is near marble quarries. Pop. 17,000.

Coin, pieces of metal stamped with various devices, and intended to circulate as currency. *See* CURRENCY; MINT; MONEY; NUMISMATICS; TRADESMEN'S TOKENS.

Coinage Weight Standards. The king's indenture specified the number of coins to the poundweight, and originally the pound of reference at the mint was the tower pound (5400 grains), but this was changed to the troy pound (5760 grains) by Henry VIII (*see* METROLOGY). The Rom. pound of 288 Rom. scruples weighed 5040 grains, and the Republican denarius c. 187 BC appears to have been struck at 72 to this pound (*Numismatic Circular*, Dec. 1955). For an analysis of the evidence relating to early GK coin standards, *see* A. E. Herringman, *Historical Metrology*, 1953. *See also* the references under COIN.

Coining in England, as in all civilised states, is a prerogative of the sovereign power, and therefore the crime of counterfeiting the current coinage is severely

punished. Under the old statutes it was made a form of treason. In 1861 the statutes relating to this offence were codified and unified for the whole U.K. by the Coining Offences Act, and this was further amended by the Counterfeit Medals Act of 1883. The Coinage Offences Act, 1936, consolidated without amendments in substance the Acts dealing with coinage offences. The following offences are high crimes, punishable by penal servitude to the extent of life: counterfeiting or making coins to resemble or pass for the current coin of the realm; colouring, casing, or washing over any coins or metals with intent to make them pass for gold or silver coin; buying, selling, receiving, or passing counterfeit coin at a lower rate than its denomination imports; knowingly importing counterfeit coin; making, mending, buying, selling, possessing, or conveying out of the Royal Mint (q.v.) any C. instruments. The clipping or lightening in any other manner of current gold and silver coin is a crime punishable with not more than 14 years' imprisonment. The following offences are punishable with not more than 7 years' imprisonment: unlawful possession of clippings, etc., taken from gold and silver coin; unlawfully making, mending, buying, selling, or possessing instruments for so doing; buying, selling, or bringing into the country counterfeit coin at a lower value than its denomination imports; possessing 3 or more counterfeit gold or silver current coins with intent to utter them. Various minor offences are punishable with imprisonment for varying periods all under 7 years. Such are the exportation of counterfeit current coin, the counterfeiting of foreign coinage, and the knowingly uttering counterfeit current copper coinage. *See also* FORGERY.

Coins (weight), *see* METROLOGY.

Coins, Foreign, *see* METROLOGY.

Coir, fibrous covering of the coco-nut. Stripped off lengthwise, the fibres are manuf. into matting, ropes, cables, etc. It is prepared as follows. After soaking for months in water until soft, the fibres are beaten to remove the superfluous matters, and then are spun into yarn and woven into articles or twisted into cables. Compared with hempen cables these are buoyant and of great strength and elasticity.

Coire (Switzerland), *see* CHUR.

Cojedes, richly forested state of N. Venezuela, formerly part of Falcón, a cattle-grazing region, with some agriculture. Coffee is grown in the N. San Carlos is the cap. (pop. 7200). Area 5710 sq. m.; pop. 52,100.

Cojutepeque, mkt tn and cap. of Cuscatlán dept. El Salvador, Central America, 7 m. NE. of San Salvador. It is situated near the volcano of the same name on the shore of Lake Ilopango. It has potteries, weaving, distilling, sugar and cotton milling, and a cigar trade. There is a celebrated ann. cattle fair. Pop. 10,000.

Cokayne (or Cokain), Sir Aston (1608-1684), poet, b. Derbyshire. He was educ.

at Trinity College, Cambridge. He was a strong Royalist, and stood firm to his religious opinions. There were 4 issues of his poems and plays: *Small Poems of divers Sorts*, embracing, besides poems, a *Masque presented on Twelfth Night, 1634* and *The Obstinate Lady* (a comedy), 1658; a reissue in 1659, entitled *A Chain of Golden Poems*, etc., including *Trappolin Creduto Principe*, or *Trappolin suppos'd a Prince* (an It. tragi-comedy); a third issue in 1662, entitled *Poems*, etc., to which was now added *The Tragedy of Ovid*; and a fourth (reissue) in 1669.

Coke, see LEICESTER, 1ST EARL OF.

Coke, Desmond, see CHILDREN'S BOOKS.

Coke, Sir Edward (1552-1634), lawyer, b. Mileham in Norfolk. He was educ. at Norwich School and Trinity College, Cambridge, and was called to the Bar in 1578. The following year he distinguished himself in the libel case *Cromwell v. Derby*, and soon after in *Shelley's case*, having been previously made reader of *Lyon's Inn*. In 1582 he married Miss Bridget Paston, receiving with her a large fortune. In 1586 he was made recorder of Norwich, in 1592 reader of the Inner Temple and solicitor-general, in 1593 Speaker of the House of Commons, and in 1594 attorney-general, thus succeeding over his rival, Bacon, who wished to be appointed to the last-named office. In 1606 he became chief justice of the common pleas, and in 1613 chief justice of the king's bench. In 1598 C.'s wife d., and he married Lady Hatton, granddaughter of Cecil, Lord Burghley. This was his second success over Bacon, for the latter was refused by Lady Hatton. The marriage proved a very unhappy one for C. Just after this he conducted sev. important trials, among them that of Sir Walter Raleigh, but this one does not redound to his credit, as his treatment of Raleigh was both discourteous and full of injustice. In his office as chief justice of the common pleas C. maintained a vigorous defence of the law, and when the eccles. courts wished to claim more power and King James was inclined to support them C. was on the defensive, and was successful in winning the king over to his side. He was opposed to James on sev. other occasions, as he had no exaggerated notion of the royal prerogative. He firmly estab. the fact that the king could neither make laws without the consent of Parliament nor could declare any action to be an offence unless it were contrary to the law of the land. In the case of *Peacham* who was accused of high treason, C. found himself in opposition to the king, and again in declining to refer to the king difficult cases in the court of chancery, as also in his contesting James's right to grant commendams, and in refusing to await the king's pleasure with regard to that granted to the Bishop of Lichfield. For these reasons he was dismissed from his office in 1616. He again took up public duties in 1620, when he was returned to Parliament as member for Liskeard. During this part of his career he concerned himself mainly with the reform of abuses. He opposed the

marriage of Charles to the infanta of Spain, and was insistent on freedom of speech for Parliament, thus alienating himself more and more from the king. After the death of James C. vigorously opposed Charles I in his illegal means of



SIR EDWARD COKE

obtaining money. He was also instrumental in drawing up the *Petition of Right*, and at the time of the Grand Remonstrance he pointed out in Parliament the evil caused in the country by the Duke of Buckingham. After this C. spent his time in retirement at Stoke Poges, where he d. See Lord Birkenhead, *Fourteen English Judges*, 1926.

Coke, Thomas (1747-1814), Methodist bishop, b. Brecon and studied at Oxford. He made the acquaintance of John Wesley, and commenced a series of open-air services that led to his dismissal from his Somerset curacy. Allied then to the Methodists, he became president of the Eng. conference, and later superintendent (bishop) of the Methodist societies in America, whither he made sev. voyages between 1784 and 1803. He pub. a *History of the West Indies* (1808-11), and, jointly with Henry Moore, a life of Wesley in 1792.

Coke, form of fuel composed of the carbonaceous substance left when coal is heated in a confined space. The volatile constituents of the coal are thus lost, and a hard, brittle, porous substance, with a slight metallic lustre, is left. It does not soil the fingers when touched, and burns with an intense heat and no smoke. These advantages, together with the facts that it is relatively free from sulphurous fumes and does not produce sparks, render it a valuable fuel for use in metallurgy and various industrial operations. C. is produced in the manuf. of coal-gas as a by-product, but this variety is of inferior quality, and the regular method of manuf. is by means of either mounds or ovens. In the former case a caking variety of

coal is stacked in a large heap round an open chimney covered with wet C.-dust, and fired from above. When all smoke has ceased to appear the air-holes are closed, and the mound is extinguished and cooled with water. The same principle is employed in closed ovens, which, however, yield a better quality with a considerable saving of time and expense. *See also* CARBONISATION.

Col des Nuages, *see* DEO-VAN.

Cola di Rienzi, *see* RIENZI.

Colac, main centre of a wealthy dairying and agric. area known as the W. Dist., 95 m. SW. of Melbourne, Victoria, Australia.

Colard Mansion, first printer at Bruges, formerly a calligrapher; he was in partnership with Caxton, 1475-7. At his press was printed about 1474 the *Recuyell of the Histories of Troye*, the first book printed in English. C. M. printed 24 books, the last being a version of Ovid's *Metamorphoses* in May 1484. He then left Bruges and is thought to have d. soon after.

Colban, Adolphe Marie (1814-84), Norwegian novelist, *née* Schmidt, whose works were very widely read in their day. Best known among them are *Lærerinden*, 1869, *Tre nye Noveller*, 1875, *Jeg lever*, 1877, and *Thyra*, 1882.

Colbert, Jean Baptiste (1619-83), Fr. statesman, b. Rheims. He entered the employment of Cardinal Mazarin in 1651, and was entrusted by him with his most important commissions. In 1661 he succeeded Mazarin as chief adviser to the young king, and in 1668 became minister of marine and also minister of commerce and of the king's household, having previously been made controller-general. He had, in fact, almost supreme power over the financial affairs of the country. C. reformed the whole Fr. financial system by doing away with extortion and unjust taxation, and by revising the method of collection. He next turned his attention to commerce, and did all that he could to increase the manufs. of the country instead of importing manuf. goods from abroad. The protectionist lines on which he worked, however, inevitably discouraged enterprise in the laymen. The inspection as to quality and measure of articles was most rigid, and the protective tariffs hampered the trade considerably. Credit is due to C. for his reconstruction of the Fr. Navy. He not only increased the number of men and ships, but also reconstructed Toulon and Rochefort, and fortified Dunkirk, Brest, and Havre. He turned his attention also to learning and art, and he encouraged scholars and artists from all parts of Europe. He had public buildings and monuments set up in Paris, and added considerably to the Louvre art collection. He experienced great difficulties from Louvois, his rival, who had control of the war dept. Peace was necessary to C. so that his reforms might be effectual, and in his later days he carried on a losing struggle to cut down the king's extravagances to this end. Louis XIV eventually transferred his favour to Louvois, and C.'s influence

gradually declined till he d., stricken with a fever which had attacked him at intervals for sev. years before his death. Within a few years of his death the financial corruption and instability of Fr. finance was to be as bad as ever.



JEAN B. COLBERT

Engraving after a painting by V. Mignard.

Colborne, Sir John, 1st Baron Seaton (1778-1863), soldier, served in the Corunna campaign. He afterwards fought with Wellington, and was wounded at Ciudad Rodrigo. He also took part in the battle of Waterloo, 1815. In 1838 he put down the rebellion in Canada. He was created Baron in 1839; Governor of the Ionian Is., 1843-9; promoted general, 1854, field-marshal, 1860; commander-in-chief of the forces in Ireland, 1855-60. *See* life by G. C. M. Smith, 1903.

Colburn, Zerah (1804-40), mathematical prodigy, b. Cabot, Vermont, U.S.A. In his earliest years he displayed such extraordinary powers of rapid calculation that from 1810 he was publicly exhibited by his father, and came to Great Britain 1812, and France in 1814. He studied from 1816 to 1819 at Westminster School at the expense of the Earl of Bristol. On the death of his father he returned to America, and was ordained in the Methodist Church. He was never able to explain how the answers came into his mind, but in his early years his calculations were accompanied by certain bodily contortions.

Colby, Frank Moore (1865-1925), Amer. editor, b. Washington. Educ. at Columbia Univ., he held appointments there and at Amherst College, and was prof. of economics at New York Univ., 1895-1900. He ed. the *New International Year Book* and the *New International Encyclopaedia*. His books include *Outlines of General History*, 1900, and many essays, collected as *The Colby Essays*, 1926.

Colby, Thomas Frederick (1784-1852),

major-general, who was connected with the Ordnance Survey (q.v.), of which he became director.

Colchagua, prov. in Chile, extending from the Cordilleras to the Pacific Ocean. Its cap. is San Fernando (pop. 14,420). The prin. crops are cereals; wine is produced, and cattle and sheep are grazed. Area 3255 sq. m.; pop. 136,850.

Colchester, Baron. This title was borne by the family of Abbot from 1817 to 1919, when the third baron d. Charles Abbott, the first baron, was Speaker of the House of Commons from 1802 to 1817.

during this period C. assumed great importance. (See *Camulodunum: First Report of the Excavations at Colchester*, 1930-9, Society of Antiquaries of London, 1948.)

The most important of the modern tn's anct monuments is the castle, which dates from 1070 and has the largest Norman keep in the country. There are numerous other buildings of historical interest, the best known being the ruins of the 12th-cent. St Botolph's Priory church, and the gateway of the 11th-cent. monastery of St John, on St John's Green. There are



M. Nichols, Colchester

COLCHESTER CASTLE

Colchester, municipal bor., mrkt tn, and riv. port of Essex, England, 52 m. from London. It stands on the R. Colne, which is navigable by vessels of 150 tons to the Hythe, 1 m. SE. and 9 m. from the sea. The recorded hist. of C., which is the oldest recorded tn in Great Britain, goes back to the coins of Cunobelinus (Cymbeline), who reigned from 5 BC until his death in AD 43. These are inscribed C A M V for Camulodunum, the Brit. name for C. (meaning the hill or fort of Camulos, god of war). On the Rom. invasion in the year 43 Camulodunum became the H.Q. of the Romans in Britain. It was burnt and devastated by Boadicea in AD 61, when that queen led a rising of the Trinobantes and Iceni against the Romans. Soon afterwards the Rom. wall was built to protect the tn. The remaining 1½ m. or more of Rom. work can be seen to advantage on Balmerne Hill and at the Balmerne Gate, the old Rom. gateway at the top of the hill; also at the steps leading up to the church of St Mary-at-the-Walls in Balmerne Lane. The Rom. occupation of C. lasted until about the year 367, and

2 museums, that in the castle keep containing chiefly, though not exclusively, Romano-Brit. antiquities, one of the finest collections of its kind in N. Europe. In the Holly Trees mansion, an early Georgian house near the castle, is a collection of domestic interest, also a valuable collection of Peruvian antiquities and various oriental exhibits. The council has recently taken over on lease a redundant C. church, in which it is proposed to estab. a natural hist. museum, with an eccles. section. This museum will be known as All Saints' Museum.

C. is a municipal bor., the earliest charter being that of Richard I (1189), and for parl. purposes is in the C. div. of Essex. Corn and cattle markets are held and the chief industries now carried on are engineering and the manuf. of clothing. The Colne oyster fishery, which produces the Pye-fect oysters, belongs to the council, and C. is also noted for its roses. C. still maintains her position as a military centre, both for the C. Garrison H.Q. and as H.Q. of the E. Anglian Dist., 3rd Infantry Div. and 19th Infantry Brigade. There are

many camps and barracks, extensive married quarters of modern design, and a large military hospital. Among the more modern buildings of the tn should be mentioned the tn hall, the co. hospital, and the new public library, in which is housed a valuable collection of books especially intended for students and presented by the Rev. Dr G. H. Rendall, a former headmaster of Charterhouse. Pop. 57,436.

Colchicum, genus of Liliaceae, containing over 50 plants, which grow wild in Europe, Asia, and Africa. In Britain it is represented by the well-known *C. autumnale*, the meadow saffron or autumn crocus. The large pale purple flowers appear in autumn without the leaves, and with the anthers and stigmas just above the surface of the soil, while the ovary and filaments remain below ground, protected from cold. The ovary becomes mature before the stamens, and pollination is effected by means of bees. In the spring-time the foliage, an erect tuft of broad, oblong, shining, sheathing leaves, appears and the capsular fruit is elevated above the soil by its lengthened footstalk. The corm of the *C.* is irregularly egg-shaped, and covered with a dry, brittle, brown skin; and it consists of a white fleshy succulent substance. When fresh, it has a nauseous, radish-like odour, when dried there is no odour; the taste is sweetish-bitter, leaving an acrid sensation in the throat. Both corms and seeds yield a stimulating, deleterious principle, colchicine; a gastro-intestinal irritant, used in medicine for gout. It is also used in plant genetics for its doubling effect on chromosomes in some plants.

Colchis: 1. In ancient geography a ter. in Asia, situated between the Caucasus on the N., Iberia on the E., Armenia on the S., Pontus on the SW., and the Euxine on the W. It was noted in Gk mythology as a home of sorcery, the land of Medea and the Golden Fleece. Its inhab. were from earliest times engaged in linen manuf.

2. Russian **Kolkhida**, swampy lowland area with subtropical climate, situated in W. Georgia (Transcaucasia), along the lower Rioni R. and the Black Sea shore. Citrus fruits and tea are cultivated.

Cold. For physical meaning see HEAT. In medical practice *C.* applied to the body subdues pain, reduces inflammation and feverish temp., arrests bleeding, and stimulates by *C.* bathing. A *C.* (Coryza), term used to indicate a catarrhal inflammation of the mucous membrane of the nose, which frequently involves the throat and may, unless checked, extend to the chest. The name derives from the sensation of chilliness which commonly accompanies its onset. The condition, which may be febrile, is usually caused by bacterial invasion, and is characterised by excessive secretion of mucous fluid ('running of the nose'), hoarseness, sore throat, headache, and, in varying degree, a general feeling of depression and malaise. The condition is infectious.

Cold Cream, or **Rose-water Ointment**, cooling dressing for the skin. It may be prepared by melting together 125 gm.

of spermaceti, 120 gm. of white wax, 560 gm. of expressed oil of almonds, and then mixing in 190 gm. of stronger rose-water. A few grammes of sodium borate are dissolved in the rose-water unless some other metallic salt of remedial properties is desired. The ointment constitutes a soothing application for chapped face and hands, abrasions etc.

Cold Harbor (Old and New), 2 localities c. 10 m. N. of Richmond, Virginia, U.S.A., 2 m. from Chickahominy R. The battle of Gaines's Mill was fought near by (1862), the Federals, under McClellan, being defeated by the Confederates under Lee. There was another battle fought between Gen. Grant and Lee, 1864, considered indecisive, though the advantage was on Gen. Lee's side. Pop. 3000.

Cold Storage, see REFRIGERATION.

Cold Water Test, or, more usually, **Hydraulic Test**, in engineering, is a pressure test for totally enclosed vessels to determine their power of resistance. The vessel is filled with cold water, and the pressure progressively increased to twice the normal working pressure.

Cold Wave, sudden and general fall of temp., usually following a winter storm and caused by a cool wind blowing towards the equator. It generally lasts only for 2 or 3 days, and is common in U.S.A. In the E. U.S.A. C. Ws from the N. plains often cause a fall of 18° F. or more, bringing the temp. below freezing-point. They cross the border between Lake Superior and the Rockies.

Colden, **Cadwallader** (1688-1776), was a Scot and a member of the medical profession. He went to America and practised medicine there, first in Pennsylvania and later in New York, and in 1761 he was made lieutenant-governor of that city. His chief works are *History of the Five Indian Nations depending on the Province of New York in America*, 1727, and *An Explication of the First Causes of Action in Matter and of the Cause of Gravitation*, 1745.

Coldingham, par. and vil. of Berwickshire, Scotland, 2½ m. from Eyemouth, 1½ m. from C. Bay. It has the remains of a famous priory, founded in 1098 by Edgar of Scotland. Fast Castle, the Wolf's Crag of Scott's *Bride of Lammermoor*, is about 6 m. off. Pop.: par., 2830; vil., 495.

Coldstream (formerly **Lenel**, **Leinhal**), par. and burgh of Berwickshire, Scotland, 13 m. from Berwick, on the R. Tweed. Smeaton's 5-arched bridge (1763-6) crosses the riv., and near by is the famous ford of the Tweed, often crossed by Scotch and Eng. armies. It was once, like Gretna Green, a refuge for runaway couples. The ann. 'Civic Week' is the first week in Aug. Pop. 2000.

Coldstream Guards, second regiment of foot-guards, forming part of the Household Brigade. It is the second regiment in age of the Brit. Army, the oldest being the Royal Scots. The C. G. were known first as Monck's Regiment, from Gen. Monck, for whom Cromwell formed it in 1650. The regiment served in Scotland until 1660, when it accompanied Monck on his march to London in that year. The

regiment's name refers to its sojourn in the border vil. of Coldstream in the winter of 1659-60. During the reigns of Charles II and James II detachments of the regiment served in Flanders, at Tangiers, and in Virginia, and under William III it served at the siege of Namur, 1695. Some companies helped to hold Gibraltar in 1704-5 after its capture by Rooke. It served under Marlborough at Oudenarde and Malplaquet, under George II at Dettingen, and under Abercrombie in Egypt in 1801. A series of battle honours for the Peninsula and Waterloo testify to its service under the great Duke of Wellington. It next saw service in the Crimea, 1854-6, this being followed by the Egyptian campaign of 1882 and Suakin in 1885, and then the Boer War of 1899-1902. During the First World War it served with great distinction and gallantly upheld its proud motto, 'Nulli secundus,' 7 V.C.s being won. Five battalions served at various periods in France and Flanders, notably at Mons (1914), Zandvoorde near Ypres (1914), Neuvo-Chapelle (1915), and in the later battles of Ypres (1917). In the Second World War the C. G. fought in NW. Europe and in Italy. As part of the Guards Armoured Div. in France in 1944 they were prominent in the passage of the Orne into the Caen plain in the battle of Normandy. Other units were in the Eighth Army (q.v.) which fought in numerous battles up the It. peninsula. The C. G. can be distinguished from other Guards by the white band round their hats and by the buttons on their tunics being grouped in pairs.

Cole, George Douglas Howard (1889-), writer on social studies, b. Ealing; educ. at St Paul's School and Oxford Univ. He is Chichele prof. of social and political theory at Oxford, and a fellow of All Souls and Nuffield colleges. A leading authority on labour questions and economics in relation to industry, he is president of the Fabian Society and of the International Society for Socialist Studies. Pubs. include *A Short History of the British Working-class Movement*, 1925-7, *A Century of British Co-operation*, 1945, *The Intelligent Man's Guide to the Post-war World*, 1947, *Money, Trade, and Investment*, 1954, and *A History of Socialist Thought* (in progress). He collaborates with his wife Margaret Isabel, née Postgate (b. 1893), in detective stories, etc.

Cole, George Vicat (1833-93), landscape painter, especially of Surrey and Thames scenes, b. Portsmouth. From 1853 he contributed frequently to the Royal Academy exhibitions. He was elected R.A. in 1880. 'The Pool of London' is in the Tate Gallery, and he produced a series of the Thames 'From Source to Sea.' See life by Chignell.

Cole, Sir Henry (1808-82), public official, art critic, and editor, b. Bath, and educ. at Christ's Hospital, one of the outstanding public servants of his day. He served first in the Public Record Office, which he helped to found; then he engaged in a variety of successful public projects and activities, some of them stemming from

his prominent position in the Royal Society of Arts. His greatest work was in organising, and remaining the guiding spirit of, the Great Exhibition of 1851. C. also bore the major share in founding what became the Victoria and Albert and Science Museums (qq.v.) of which he was also in charge for many years. He was also the prime mover in founding the Albert Hall, the Royal College of Music, a school of cookery, etc. See *Fifty Years of Public Work*, 1884.

Cole, Thomas (1801-48), noted Amer. landscape painter. He went from England to the U.S.A., 1819; from Ohio to New York, 1825. He travelled to London, Florence, and Rome between 1829 and 1832. He aimed chiefly at historical or allegorical landscapes (for examples see New York Historical Society's rooms). Among his works are 'Views of the Catskills and White Mountains,' 'The Voyage of Life' (4 pictures), 'The Course of Empire,' 'View of Mount Etna taken from Taormina,' and 'Kenilworth Castle.'

Cole, Timothy (1852-1931), Amer. wood engraver, b. London. In 1875 he began to work for the *Century Magazine* (then *Scribner's*). His work attracted widespread attention, and he was sent to Europe to make engravings after the old masters (1883), which met with great success and were the last brilliant effort in a craft soon to be rendered obsolete by photographic reproduction. He received medals at the Paris and St Louis exhibitions.

Cole, see RAPE.

Colebrooke, Henry Thomas (1765-1837), pioneer in Sanskrit studies. His father, who was chairman of the E. India Co., secured his son a post in the company's service. C.'s first paper was *On the Duties of a Faithful Hindu Widow*, 1794. His main work was *A Digest of Hindu Law on Contracts and Successions* (trans. from the original Sanskrit), in 4 folio vols., Calcutta, 1798. In 1805, he became president of the Calcutta Court of Appeal, and prof. of Hindu law and Sanskrit at the recently founded college of Fort William. In his *Grammar of the Sanskrit Language*, 1 vol., 1805, C. summarised the work of the native grammarians. His treatise *On the Vedas*, 1805, is a pioneer work in Vedic studies. *Algebra, with Arithmetic and Mensuration etc.*, 1817, is his main work on mathematics. From 1807 to 1814 he was president of the Asiatic Society of Bengal. In 1814 he returned home.

Coleotomy, in surgery, the name given to the operation of removal of part of the colon or large intestine, and the consequent reuniting of the severed ends, so as to complete the circuit. This course is rendered necessary in cases of tumour or stricture in the part.

Coleford, par. and mrkt tn of Glos., England, 8 m. NW. of Lydney, in the mining dist. of the Forest of Dean. The tn hall was built in 1662. The Speech House, where the Verderers' Court was once held, is now an hotel. The court room possesses a musicians' gallery. Pop. urb. dist. and par. 2800.

Colemanite, hydrated calcium borate. $\text{Ca}_2\text{B}_2\text{O}_7 \cdot 5\text{H}_2\text{O}$, one of the chief sources of borax and boric acid. Important deposits are found in the SW. of California. They are found in hot springs and volcanic lakes.

Colenso, John William (1814-83), Bishop of Natal and a celebrated mathematician, b. Cornwall. He was educ. at Cambridge, where he was second wrangler in 1836. From 1838 he was assistant master at Harrow, and from 1842 tutor at Cambridge. In 1846 he became rector of Farningham St Mary, Norfolk, and pub. mathematical textbooks on arithmetic, algebra, and plane trigonometry. His *Village Sermons* appeared in 1853, in which year he was appointed Bishop of Natal. He at once studied the Zulu language, and after a while prepared a grammar and dictionary, and trans. part of the Prayer Book and Bible. In 1861 he pub. his *Translation of St Paul's Epistle to the Romans, commented on from a Missionary Point of View*, in which he set forth his objection to the doctrine of eternal punishment. His next work, *The Pentateuch and Book of Joshua critically examined*, 1862-79, made him the apostle of the higher criticism, and provoked a storm of protest. His book was condemned by both Houses of Convocation as heretical (1864), and he was declared (Dec. 1863) deposed from his see by Bishop Gray of Cape Town. The Privy Council, however, declared the deposition null and void. Bishop Gray then publicly excommunicated him, and in 1869 appointed Dr Macrorie Bishop of Maritzburg, with authority over practically the same diocese. Later C. opposed the oppressive measures taken by the Boers and Cape officials against the Zulus, and the policy of Sir Bartle Frere during the Zulu war. He pleaded the cause of the chiefs Langalibalele and Cetwayo, and was regarded by the Zulus as their protector. Other works by him are *Ten Weeks in Natal*, 1855, *The New Bible Commentary Literally Examined*, 1871-1874, *Lectures on the Pentateuch and the Moabite Stone*, 1873, and *Sermons* 1873. See Sir G. W. Cox, *The Church of England and the Teaching of Bishop Colenso*, 1888.

Colenso, vil. and railway station, Natal, S. Africa, 70 m. from Pietermaritzburg, on R. Tugela, which is here spanned by a bridge. It was the scene of Buller's unsuccessful attempt to cross the Tugela, Dec. 1899, during the Anglo-Boer war, 1899-1902. The Electric Supply Commission has erected a power station in connection with the electrification of the railway. Pop.: Whites, 766; Bantu, 1005; others, 317.

Coleone, **Bartolomeo**, see COLLEONI.

Coleoptera (Gk *koleos*, sheath; *pteron*, wing), order of insects known familiarly to us as beetles. The species have 4 wings; the front pair, the elytra, are hard and leathery, and when at rest they fit together closely over the hind wings, and a straight suture lies between them; the hind pair are used in flight and are membranous. The mouth parts are biting

and have mandibles, the lower lip is not divided along the middle. The metamorphosis is complete, the larva is a grub and develops into a pupa which exhibits the external structure of the perfect insect. There are known to scientists about 180,000 species, of which over 3000 belong to Britain. See BEETLE.

Colepeper, or **Culpeper**, John, 1st Baron (d. 1660), Eng. Royalist politician. He was a member of the Long Parliament (1640) siding against Strafford, but subsequently supporting episcopacy, and opposing the Scottish demand for religious union. Privy councillor and chancellor of the exchequer in 1642, he became one of Charles I's advisers and fought for him at Edgehill. C. was raised to the peerage, 1644. He accompanied the prince (later Charles II) to France in 1646.

Coleraine, mkt tn of co. Londonderry, N. Ireland, on the R. Bann, 4 m. from the sea. It is noted for its linen manufs., and has shirt and collar factories, and food processing industries. There are also good salmon fisheries. Pop. 10,750.

Coleridge, Derwent (1800-83), author and educationist, b. Keswick, Cumberland, son of Samuel Taylor C. (q.v.). Educ. at Ambleside School and St John's College, Cambridge, he took orders in 1825 and from then till 1841 was master of Helston Grammar School, Cornwall, one of his pupils being Charles Kingsley (q.v.). Here he wrote his largest work, *The Scriptural Character of the English Church*. In 1841 he was appointed the first principal of St Mark's College, Chelsea, and did much to advance elementary education.

Coleridge, Hartley (1796-1849), poet, b. Clevedon, Somerset, eldest son of Samuel Taylor C. He early showed uncommon gifts and a temperament still more remarkable. After the separation of his parents, he was brought up in Southey's family at Greta Hall, being educ. chiefly at Ambleside. Urged by Southey, his well-to-do relatives sent him to Oxford. Intensely sensitive, impatient of control, shy and awkward, of a somewhat bizarre appearance, and infirm of will, Hartley got into trouble with the college authorities, and lost an Oriel fellowship through intemperance. He received a gift of £300 from the college, but the blow was intolerable, and left him for the rest of his life despondent, self-reproachful, and lacking in concentration. After 2 ineffectual years in London, Hartley returned to the Lake country, where he made 2 widely separated attempts at school-teaching. In the interval (c. 1830) he lived for some time at Leeds in the family of F. E. Bingley, a publisher, with whom he produced a biographical work on *Lives of Illustrious Worthies of Yorkshire*, 1835. He is, however, best known for his verse, which, if lacking in power, is singularly fine in mood and happy in expression. His sonnets are among the most perfect in the language. From 1838 Hartley lived at Grasmere, spending his time in study and reverie. His chief literary effort was an ed. of Massinger and Ford 1840, including valuable biographies of the dramatists. He d. of bronchitis, and

was buried in the place chosen for him by Wordsworth, who was laid beside him a year later. Four vols. of his prose and poetry were ed. by his brother Derwent, 1851. As a critic Hartley is delicate and suggestive; as an essayist quaintly humorous, resembling Charles Lamb; and in conversational powers, according to tradition, second only to his father. See *Poems*, with a memoir by his brother, D. Coleridge, 1851; E. L. Griggs, *Hartley Coleridge, his Life and Work*, 1929; E. Blunden, *Coleridge the Less*, 1931.

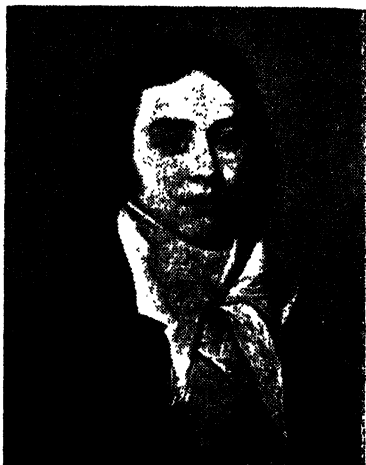
Coleridge, Herbert (1830-61), philologist, son of Henry Nelson and Sara C., b. Hampstead. In 1853 he began practising as a chancery barrister at Lincoln's Inn. His leisure hours he devoted to philological studies—Sanskrit, the N. tongues, and particularly the Icelandic language and literature. In 1857 he was elected a member of the Philological Society, to which he contributed 2 papers. The society was planning a supplement to the standard dictionaries of Johnson and Richardson, which soon developed into a scheme for a complete new Eng. dictionary. C. was appointed honorary secretary of a special committee 'formed for the purpose of collecting words and idioms hitherto unregistered.' His new duties, for which he was admirably fitted, practically constituted a general editorship of the work; the results of his researches are embodied in his *Glossarial Index to the Printed English Literature of the Thirteenth Century*, 1859, which he describes as the foundation stone of the proposed dictionary. The scheme developed into the *New English Dictionary* (Clarendon Press).

Coleridge, Sir John Duke, 1st Baron Coleridge (1821-94), jurist, son of Sir John Taylor C., b. Ottery St Mary. Among his friends and contemporaries at Balliol were Archbishop Temple, Matthew Arnold, Arthur Clough, and Principal Shairp. He was called to the Bar in 1846, and soon gained practice, thanks to his musical voice, his eloquence (which earned him the nickname of silver-tongued C.), and his powers of persuasion. He became recorder of Portsmouth, Q.C., and M.P. for Exeter, as a Liberal, from 1865 to 1873. He supported the Bill for the abolition of religious tests in the univ., and took part in the debates on the disestablishment of the Irish Church. He became lord chief justice of England in 1880. His chief forensic triumph was in the famous Tichborne case, his speech for the defendant lasting 23 days. See E. H. Coleridge, *Life and Correspondence of Lord Coleridge*, 1904.

Coleridge, Mary Elizabeth (1861-1907), poetess and novelist, b. London, a grand-niece of Samuel Taylor C. Educ. at home, partly by W. J. Cory (q.v.). In 1893 she pub. her first novel, *The Seven Sleepers of Ephesus*, and 3 years later a vol. of poems, *Fancy's Following*, but it was her historical romance *The King with the Two Faces*, 1897, that made her name as a writer.

Coleridge, Samuel Taylor (1772-1834), poet and philosopher, the son of the Rev.

John C., vicar of Ottery St Mary, Devon. He was only 9 years old when his father d. A presentation to Christ's Hospital being obtained, he was a scholar there from 1782 to 1790, among his fellow pupils being Charles Lamb, with whom he formed a lifelong friendship. His love of the classics, especially Lat. authors, attracted the notice and esteem of the headmaster, Dr Boyer, but strangely enough, for nearly 2 years (c. 1787-9) he was so engrossed with theological and metaphysical studies that, as he himself says, 'everything else



National Portrait Gallery

SAMUEL TAYLOR COLERIDGE

The painting by Peter Vandyke.

became insipid.' What is still more wonderful, he was relieved from this obsession by reading the sonnets of Wm Lisle Bowles (q.v.), a popular poet of his day. He acquired a considerable knowledge of Greek, and at Jesus College, Cambridge, which he entered in Feb. 1791, he won the Browne gold medal for a *Gk* ode on the slave trade. But the fatal desultoriness which clouded his after-life showed itself thus early; his studies were irregular, and his rooms were the constant resort of friends who came to enjoy his conversation on all kinds of subjects, especially politics, in which he took intense interest. In 1793, a friend of his being expelled for Unitarianism and sedition, he too left the univ., went to London, and being without resources enlisted in the 15th Dragoons under the name of Silas Tomkins Comberbach, or Comberbacke. His life as a recruit not being happy, he wrote one day on the stable wall: 'Eheu, quam infortunium miserrimum est fuisse felicem!' (an adaptation from Boethius), which attracting the notice of an officer, led to inquiries. Friends

obtained his discharge, and he returned to college.

Visiting Oxford in June, he made the acquaintance of Southey, and the two evolved a delightful scheme of pantisocracy, suggested by certain visionary Fr. philosophers. An ideal community was to be estab. on the banks of the Susquehanna, where brethren (and sisters) should dwell together in altruistic unity. But the colony was never founded. The 2 friends also collaborated in writing *The Fall of Robespierre*, a drama full of bombastic rhetoric, which was pub. about the time that C. finally left Cambridge, without a degree, towards the end of 1794. He next delivered in Bristol a course of political lectures, very Jacobinistic, and exceedingly virulent in their attacks on Pitt. He also wrote some poems, pub. by his friend Joseph Cottle, the Bristol bookseller to whose reminiscences we owe the account of C. in these years. These poems, while containing some promise of future distinction in style, were often weak, conventional, and, as even their author allowed, turgid. In Oct. 1795 he married Miss Sara Fricker, whose sister Edith soon after became Mrs Southey. He settled at Clevedon for a short time, but returned to Bristol. He was soon tired of Bristol, and went to Nether Stowey, where he met Wordsworth. C.'s marriage was an unfortunate one; his wife, though an excellent woman, was incapable of affording him intellectual and spiritual companionship, or the support which his moral weaknesses unhappily required. Projecting in 1796 a paper to be called the *Watchman*, which was to be a Herald of Truth, and, to avoid the stamp-tax, was to appear every eighth day, C. started off on a tour to canvass for subscribers, preaching Unitarian sermons as he went, probably the strangest canvasser ever seen. His adventures, as told in his *Biographia Literaria*, 1817, are very amusing. The *Watchman* appeared, reached its tenth issue, and died a very natural death. Within the next 2 years he wrote the *Ancient Mariner*, the first part of *Christabel*, *Kubla Khan*, the *Ode to France*, in fact nearly all his finest poems. The first-mentioned was included in the *Lyrical Ballads*, 1798, a vol. planned by the 2 poets in conjunction. C. was to deal with the supernatural, Wordsworth with subjects of everyday life; the *Ballads*, however, contained only a few pieces by the former. The little vol. was very ill received. Among other notices, the *Monthly Review* spoke of the *Ancient Mariner* as 'the strangest story of a cock and a bull that we ever saw on paper.' It may be observed also that nearly 20 years later, when *Christabel* and *Kubla Khan* appeared, the same *Monthly Review* sagely remarked: 'That so much superior genius should be corrupted and debased by so much execrable taste must be a subject of sincere lamentation to every friend of poetry.'

In 1798 Josiah and Thomas Wedgwood allowed him £150 per annum on the implied condition that he should abandon preaching (he had accepted a Unitarian

ministry in Shrewsbury) and devote his time to literature. His revolutionary enthusiasm had been disillusioned by the course of events in France, and, desirous of studying Ger. philosophy, he spent about 9 months at Ratzburg and Göttingen, mastering the language, attending the lectures of Prof. Blumenbach, and enjoying glorious hours of oratory and disputation among his fellow students. Returning to England in 1800, he produced his excellent trans. of *Wallenstein*. This sold so badly that the publishers, Messrs. Longman, disposed of the greater part of the ed. as waste paper. During this year the *Morning Post*, which had already pub. his *Ode to France* and other pieces, engaged him to write a series of political articles. His articles appeared irregularly for 2 years, and then ceased. In the summer of 1800 he removed with his family to Greta Hall, Derwentwater, to be near Wordsworth, who was living there. But he had been a frequent sufferer from rheumatism ever since boyhood, and the Westmorland climate affected him severely. In the spring of 1801 he began to take opium to relieve his pain; the habit rapidly increased, and, as De Quincey says, 'killed him as a poet.' He became restless and miserable, doing little work, but projecting grandiose schemes which all died in thinking, such as that for an immense *Bibliotheca Britannica*, outlined by him in a letter to Southey, Aug. 1803. Friends came to his assistance; Southey took Greta Hall off his hands, Wedgwood, Wordsworth, and others were full of kindness, and in 1804 he received an invitation to Malta, where he had barely arrived when he was invited to become secretary to the governor, Sir Alexander Ball, a position which he filled with the greatest capacity. This appointment he held for 10 months, but his health did not improve, and he went on to Naples and Rome. About midsummer 1806 he was perturbed by a rumour that he was in danger from emissaries of Bonaparte, on account of his anti-Napoleonic essays in the *Morning Post*. This story has been ridiculed, but it so impressed C. that he speedily departed from Leghorn, taking passage in an Amer. ship.

He arrived home safe, but miserably broken in mind and body, and the record of his next 10 years is a painful story of suffering, weakness, and vacillation. Estranged, though not altogether separated from his wife, he moved from place to place, sometimes alone, sometimes with his family. At Bridgewater in 1807 he met for the first time with De Quincey, who was so impressed that, through Cottle, he sent C. an anonymous gift of £300. A series of lectures begun in London, Jan. 1808, on 'Poetry and the Fine Arts,' was a failure, and it is not quite clear how he got through the year, but in 1809 he started a magazine, the *Friend*, under such impossible conditions that its life of 8 months was remarkable for length, yet it contained some of C.'s finest prose. Some lectures on Shakespeare and other poets were, however,

successful, and he wrote regularly for the *Courier* (1811-12), while his play *Remorse* was well received at Drury Lane. Nevertheless he was continually in pecuniary difficulties; opium had wrecked him morally and physically, and at one time his family was left almost entirely on the hands of Southey and a few other friends. It was now recognised that to give money to C. himself was merely to furnish him with the means of self-degradation. In 1814 he was taking 2 to 3 quarts of laudanum per week, or even more, and he had not sufficient will-power to break off the habit. From 1816 to 1819 he lived with his friend Morgan at Calne, and finally was persuaded to put himself under the charge of a medical man, Mr Gillman of Highgate, as a resident patient. He could not possibly have been in better hands; the fatal vice was gradually subdued, a warm attachment grew up between doctor and patient, and Mr Gillman's house was C.'s haven of safety, which he seldom left during the rest of his life. While he was at Calne he prepared for the press *Christabel and other Poems*, 1816, written nearly 20 years before, and other works followed at intervals, including *Sibylline Leaves* (a revised reprint of his poems with a few additions), *Lay Sermons*, and the *Biographia Literaria*, 1817. Fourteen literary lectures, delivered in 1818, were successful in every way, and a remarkable account is given by Mr Gillman of an extra one, delivered extemporarily, the subject, 'The Growth of the Individual Mind,' being given to the lecturer at the last moment. The discourse, says Mr Gillman, was 'brilliant, eloquent, and logically consecutive,' a wonderful achievement. Unfortunately few of his lectures have been preserved except in the shape of rough notes, but these and his *Literary Remains* prove him to have been one of the greatest poetical, and especially Shakespearian, critics. *Aids to Reflection* appeared in 1805, *Church and State* in 1830, but his finest prose work, *Confessions of an Inquiring Spirit*, was pub. posthumously in 1840.

He began life as a warm supporter of the revolution, and his first vol. of verse emphatically proclaimed his democratic enthusiasm. But disillusion soon came and, like his friend Wordsworth, he turned, politically, to Conservatism. With Wordsworth, however, a strong interest in concrete humanity outlived the chaos of his early hopes. C., however, while always interested in the general affairs of the nation, lacked Wordsworth's intense sympathy with individual men and women. His tendency was to live among abstractions, a tendency intensified by his application to metaphysics and theology. As a philosopher he founded no school, yet exercised a great energising and spiritualising influence on Eng. thought. As a poet he is *sui generis*. In his theory of poetry he stressed the aesthetic quality as the primary consideration, and regarding the language of poetry, he concurs with Wordsworth's 'remonstrance in behalf of truth and nature,' though he entirely rejects his

special theories. C.'s *Ancient Mariner*, *Christabel*, and *Kubla Khan* stand by themselves, pictures from magic realms, lit with 'the light that never was on sea or land,' while the motrical theory on which *Christabel* is constructed was the beginning of a new era in Eng. poetry, helping perhaps more than any other single agent to break the fetters of 18th-century correctness and monotony. Heartily abused at first, it soon found disciples, among others Scott and Byron. C.'s prose style is brilliant and profound, but diffuse. Hazlitt has well characterised it in the following mischievous paragraph: 'One of his sentences winds its "forlorn way obscure" over the page like a patriarchal procession with camels laden, wreathed turbans, household wealth, the whole riches of the author's mind poured out upon the barren waste of his subject. The palm-tree spreads its sterile branches overhead, and the land of promise is seen in the distance.' As a conversationalist C. was unrivalled, fascinating all who met him. His personal appearance has been described by many of his friends, including Dorothy Wordsworth, De Quincey, and Southey, and mostly their descriptions agree. Southey says that the power of his eye, forehead, and brow was astonishing, but that nothing could be more imbecile than the rest of his face. C. himself says to Thelwall (in 1796): 'My face, unless when animated by immediate eloquence, expresses great sloth, and great, indeed, almost idiotic, good nature. 'Tis a mere carcass of a face, fat, flabby, and expressive chiefly of inexpression. Yet I am told that my eyes, eyebrows, and forehead are physiognomically good' (*Letters*, ed. E. H. Coleridge, No. 64). In 1797, Dorothy Wordsworth in describing him speaks of the plainness of his features, but adds: 'If you hear him speak for five minutes you think no more of them.' And even in his decrepitude Carlyle speaks of him as 'the most surprising talker extant in this world.' See J. D. Campbell, *Samuel Taylor Coleridge*, 1894; Sir A. T. Quiller-Couch, *Coleridge*, 1913; H. I. A. Fausset, *Samuel Taylor Coleridge*, 1926; J. L. Lowes, *The Road to Xanadu*, 1927; J. H. Muirhead, *Coleridge as Philosopher*, 1930; Sir E. K. Chambers, *Samuel Taylor Coleridge*, 1938; H. House, *Coleridge*, 1953.

Coleridge, Sara (1802-52), b. Greta Hall, near Keswick. A daughter of Samuel Taylor C., she lived under the care of Southey and in the frequent society of Wordsworth. She pub. (1821) an excellent trans. of Dobrizhoffer's *Lat. Account of the Abipones*, an equestrian people of Paraguay, and also trans. the *Memoirs of the Chevalier Bayard*, 1825. Her *Pretty Lessons in Verse for Good Children* appeared in 1834, and *Phantasmion*, an imaginative fairy-tale, in 1837. In 1843 her husband, Henry Nelson C., d. and she continued his task of editing and annotating her father's works. She left a son and a daughter who pub. *Memoir and Letters of Sara Coleridge*, 1873. See also E. L. Griggs, *Coleridge Fille*, 1940.

Coleridge-Taylor, Samuel (1875-1912),

musical composer of Anglo-African descent, *b.* London. His father was a native of Sierra Leone, his mother an Englishwoman, and he was brought up under Eng. influences. He won the composition scholarship at the Royal College of Music in 1893, and studied under Stanford till 1896. He organised a series of successful orchestral concerts at Croydon, and wrote for the Three Choirs festivals and the Birmingham and Leeds festivals. In 1898 his choral-orchestral *Hiawatha's Wedding Feast* was performed at a concert of the Royal College of Music. After this his reputation was estab. with the remainder of his trilogy, namely *The Death of Minnehaha*, 1899, and *Hiawatha's Departure*, 1900. Other works include *The Blind Girl of Castel-Cuillé* and *Meg Blane*; *A Tale of Old Japan*, 1911, a cantata; *The Atonement*, sacred cantata; works for orchestra, for chamber combinations; Negro melodies for piano; incidental music for plays; and songs.

Coles, Cowper Phipps (1819-70), naval architect and officer, who served at Sebastopol with distinction, 1854, becoming captain, 1856. He invented shot-proof rafts of floating batteries, and was keenly interested in the construction of turreted ships. His claim to be the originator of the *Monitor* type of ironclads must be yielded to Ericsson and others. C. was drowned in the capsizing of the *Captain* in a gale off Finisterre.

Colesburg: 1. Dist. of N. Cape Colony. 2. Also cap. of above, 57 m. from Middelburg, 142 m. from Bloemfontein, with 8 churches and synagogues. It is high, dry, and a health resort, and has sulphur springs. It was the scene of active operations in the Anglo-Boer war, 1899-1902. Pop.: white, 1064; Bantu, 1184; Coloureds, 1064.

Colesseed, see RAPE.

Coleshill, mrkt tn and par. of Warwickshire, England, Sutton Coldfield div., 8 m. from Birmingham, on the R. Cole. Pop. 6000.

Colet, John (c. 1467-1519), priest and scholar, *b.* London, son of Sir Henry C., and educ. at Oxford. About 1493 he made a tour on the Continent, where he studied law and the humanities. In 1496 he returned to England, living for the next few years in Oxford, where he lectured on St Paul's epistles. C. became great friends with Erasmus (q.v.) and in 1505 he was made dean of St Paul's, and soon came to know Sir Thomas More (q.v.). In the same year he inherited a fortune from his father, and with some of this money he founded St Paul's School (1509). In 1514 he made a pilgrimage with Erasmus to Canterbury, and the next year preached in Westminster Abbey when Wolsey was installed as cardinal. He *d.* 4 years later, and was buried in St Paul's. It is rather for his learning and attitude to the advancement of knowledge than for his own writings that C. is remembered. The 'New Learning' or Humanism, as it was called to distinguish it from the old scholasticism, reached its zenith in the closing years of the 14th, and early years of the 16th, cents., its supreme

exponent, Erasmus, being the friend of the Eng. humanists, chief of whom were More, C., and Fisher. C., like More, was well grounded in Greek, and it is said to have been through his influence and that of More and Linacre that Erasmus applied himself to Greek. C. preached also against abuses in the Church, although he questioned no dogmas, being only anxious for reform from within the estab. framework of Catholicism. See life by Sir J. Marriott, 1933.

Colet, Louise (née Revoll) (1810-76), Fr. writer, *b.* Aix. In 1834 she married the musician, Hippolyte C. Her first vol. of poems, *Fleurs du Midi*, appeared in 1836 and attracted considerable attention. On sev. occasions her poems were crowned by the Fr. Academy. Mme C. was intimate with Cousin, de Musset, Villemain, and Flaubert. Among her poems are *Les Chants des vaincus*, 1840, *Charlotte Corday et Madame Roland*, 1842, *La Religieuse*, 1856. Her prose works include *La Jeunesse de Mirabeau*, 1841, *Lui, Roman contemporain* (biography disguised as fiction), 1859, *Les Derniers Abbés*, 1868. She also gained notoriety by being involved in various public controversies.

Colette, pseudonym of Sidonie Gabrielle Claudine Colette (Mme Henri de Jouvenel) (1873-1954), Fr. writer. Her earliest works include a series of stories of a semi-autobiographical character, entitled *Claudine à l'Ecole*, 1900, *Claudine à Paris*, 1901, *Claudine en ménage*, 1902, and *Claudine s'en va* (in collaboration with M. Willy, 1903). Among her novels, which reveal an exquisite sensitiveness, are *L'Ingénue libertine*, 1905, *La Retraite sentimentale*, 1907, *La Vagabonde*, 1910, *L'Entrave*, 1914, *Chéri*, 1920, *La Fin de Chéri*, 1926, and *La Châlle*, 1933. She has also written short stories, essays, and some plays. She was a member of the *Académie Goncourt* (1945), and Chevalier of the Legion of Honour. See M. Crosland, *Mme Colette*, 1953.

Colgate University, for men, was founded by Baptists in 1820 at Hamilton, New York, as Hamilton Literary and Theological Institution. It bore the name Madison Univ. from 1846 to 1890, when it assumed its present name, honouring a family that had long played an important part in it. The theological dept was merged in 1928 with the seminary at Rochester, New York, as Colgate-Rochester Divinity School. The library contained 216,000 vols. in 1956. Teaching staff, 127; students, 1300.

Colic, spasmodic, painful contractions of the muscle of the wall of the bowel or other hollow abdominal viscous. It is a state of exaggerated peristalsis (q.v.). *Renal C.*, C. of the pelvis of the kidney and of the ureter (q.v.). *Biliary C.*, C. of the gall bladder or bile ducts (q.v.). *Vesicular C.*, C. of the bladder.

Coligny, Gaspard de (1519-72), Fr. soldier, *b.* of noble family at Châtillon. He served with distinction in the campaign of Francis I and Henry II, and in 1552 was made admiral of France. In 1557 he was captured at St Quentin—which was besieged by the Spaniards—

and was imprisoned in the fortress of L'Écluse, but subsequently ransomed. It was at about this time that he became a Protestant. C. fought reluctantly against the Crown at Dreux, St Denis, Jarnac, and Montcontour, in most of which battles he was defeated. In 1570 peace was signed at St Germain, and C. returned to court, where he soon became a favourite of Charles IX. Catherine de' Medici, however, saw her own influence dwindling, and on 22 Aug. 1572 an unsuccessful attempt was made on C.'s life. He was then only slightly injured, but 2 days later, during the massacre of St Bartholomew, C. was murdered in his own house. See L. J. Delaborde, *Gaspard de Coligny, Admiral of France*, 1879-82.

Coligny, Odet de (c. 1517-71), Fr. Protestant leader, brother of Gaspard de C. (q.v.). He was created cardinal, 1533; Archbishop of Toulouse, 1534; and Bishop of Beauvais, 1535. He did not openly profess Protestant views till 1560, and even afterwards was still known as Le Cardinal de Châtillon. In 1561 he publicly renounced Catholicism, and was excommunicated by the Pope, 1563. C. was plenipotentiary of the Huguenots during the civil war of 1567-8, and went to England to escape from Catherine de' Medici, and to try to obtain Eng. help for the Protestant cause. He was poisoned, probably at her command, at Hampton Court, when intending to return to France, after the declaration of peace (St Germain, 1570).

Colima: 1. State of Mexico, bounded by Jalisco on the N., the Pacific Ocean on the SW., and Michoacan on the E. The surface is mostly mountainous. Among its products are coffee, sugar, maize, pulse, rice, tobacco, palm-oil, corn, cotton, and rich fruits. It exports much coffee, hides, and palm-leaf hats. There are salt deposits in the coast region, and ore deposits in the mts. Area 2010 sq. m.; pop. 112,300.

2. Cap. of above, 45 m. from Manzanillo, the chief port in the valley watered by C. R. It is a great commercial and agric. centre. Pop. 22,600. Also a volcano near by, 12,800 ft (in eruption in 1869), and a snow mt, 14,250 ft.

Colin, Alexander (1526-1612), Flem. sculptor, b. Malines. Ferdinand I commissioned him to help with the monument erected to Maximilian I at Innsbruck, and the greater part of the work on this tomb was done by him. C. held the post of sculptor to the emperor, and in the church where Maximilian's tomb is are those of the Archduke Ferdinand and Bishop Jean Näs, both the work of this sculptor.

Coliseum, see **COLOSSUM**.

Colitis, inflammation of the mucous membrane of the colon, which is that part of the large intestine extending from the caecum to the rectum.

Coll, is. in Argyll, Scotland, one of the Inner Hebrides on the W. coast of Mull, 10 m. from Ardmurchan Point. Length 12 m., breadth 1-4 m. It has sev. small bays and a harbour at Arinagour. The is. has a wide reputation for its cheese. Pop. 210.

Colladon, Jean Daniel (1802-92), Swiss engineer, b. Geneva. He won the Grand Prix at the Academy of Science in Paris in 1827 with *Mémoire sur la compression des liquides et la vitesse du son dans l'eau*, and 2 years later received the professorship of mechanics at the School of Arts and Manufs. in that city. He invented a dynamometer which was adopted by the Brit. Admiralty, and developed the use of the energy stored in compressed air in tunnelling operations in 1852. His most important work is *Mémoires des savants étrangers*, 1838.

Collagen, main fibrous protein of animal connective tissues, skin, tendon, and bone, precursor of gelatine (q.v.).

Collapse, see **SHOCK**.

Collapse, Pulmonary, or **Apneumotosis**, term used to signify that condition when a portion of a lung ceases to expand and contain air with inspiration. It may be caused in 2 ways, either, as in the case of an effusion of fluid in pleurisy, or air in the pleural space as in pneumothorax (q.v.), by pressure being exerted on the outside of the lung, or, as in the case of a blocking of the bronchial tube by a tumour or inflammatory exudate, by an obstruction preventing the access of air to the lung. When the C. is extensive or involves the whole lung, respiratory embarrassment is severe. Total C. of both lungs is fatal. Another name for C. is *atelectasis* and this term is often applied to a condition in which the lungs of a newborn baby fail to expand at birth.

Collatio, or **Mosaicarum et Romanarum Legum Collatio**, or **Lex Dei**, compilation comparing the law of Moses and Rom. law in 16 titles, probably dating from the 6th cent. AD. Each title is headed thus by legal rules from the law of Moses, 'Moses dicit.' There follow, by way of comparison, rules of Rom. law from the 5 Rom. jurists, Papinian, Paulus, Gaius, Ulpian, and Modestinus (3rd cent. AD), and from the 3 compilations which preceded Justinian's *Corpus Juris Civilis* (6th cent. AD), *Gregorianus Codex*, *Hermogenianus Codex*, and *Theodosianus Codex* (from the time of Constantine to that of Theodorus II, first pub. AD 438). The C. is valuable for its extracts from the above sources. It is printed in Schulting's *Jurisprudentia Velus Ante-Justiniana*, 1717. An ed. by Blume appeared in the Bonn ed. of the *Corpus Juris Ante-Justinianei*, and a separate ed. in 1833.

Colcott, Thomas Edward (1840-1924), architect, b. Oxford; trained in London; president Royal Institute of British Architects, 1906-8. Designed the Imperial Institute, 1893; also the Palace Theatre, and extensions to the Savoy Hotel—all in London; Blackburn public library, 1872; Wakefield tn hall, 1880, etc.

Colle, Raffaellino dal, It. painter, b. Colle, near Borgo San Sepolcro, c. 1490. He was a pupil of Raphael and then of Giulio Romano. He assisted Raphael in the decoration of the Vatican. He was a minor but meritorious member of the Rom. school.

Colle Salvetti, It. tn in Tuscany (q.v.).

9 m. ENE. of Leghorn (q.v.). Pop. 10,000.

Colle val D'Elsa, It. tn in Tuscany (q.v.), on the Elsa, 12 m. NW. of Siena (q.v.). It is 2 parts, Colle Alto and Colle Basso, and has a medieval cathedral, other fine churches, and anct palaces. Paper and glass are manuf. Pop. (com.) 10,000.

Collect, brief prayer appointed as the prin. prayer in the first part of the Mass before the Epistle, and also in the Offices of the Church, and offered up for some special purpose or on some special day. The etymology of the word is uncertain, though it is evidently derived from Lat. *colligere*, to collect. The prayer collects or gathers up in a comprehensive form the petition of all the people assembled. Thus it was offered up before the whole congregation, *ad collectam*, and was distinguished from prayers offered up in the main part of the mass, *ad missam*. Some argue, however, that the prayer was so called because it collected or gave a brief paraphrase of the teaching of the epistle and gospel, which it immediately precedes. The form of the C. is very simple. It begins with an invocation to God, contains 1 single petition, with special reference to the day or event celebrated, and closes in praise to Jesus Christ. The C.s of the Common Prayer Book are trans., for the most part, of the C.s of the Lat. Missal, which were composed at a very early date. Many are derived from the sacramentaries of St Leo (AD 440-61), of St Gelasius (492-6), and of Pope Gregory (590-604). See F. Procter and W. H. Frere, *A New History of the Book of Common Prayer*, 1905.

Collective Bargaining. In the early days of trade unionism the outlook of the unions reflected both industrial aspirations and political ideas; but by about 1850 they were concentrating much more on the improvement of working conditions. The next stage was the estab. of some agreed relationship with employers' and employees' organisations. Conciliation Boards, with a form of procedure confined to the treatment of disputes, were set up in many industries; but with the development of industry the scope of this arrangement was widened and, by 1900, a number of the staple industries had adopted the practice of C. B. The term 'collective bargaining' is applied to those arrangements under which the wages and conditions of employment are settled by a bargain in the form of an agreement between employers or associations of employers and work-peoples' organisations; but in unorganised trades the individual workman accepts or refuses the terms offered by the employer without reference to anyone else's interests than his own. For many years collective agreements have played a most important part in the regulation of working conditions in Britain, embracing a great variety of matters including not only wage rates but also hours of work, piece-work arrangements, holidays, etc. The terms and conditions laid down in the

agreement are applied not only to members of trade unions but also to non-unionists. Trade agreements are also largely observed by employers who are not party to them. This system of C. B. includes also agreements regarding the procedure for settling questions as they arise, and in no other country has so much been achieved towards evolving machinery for the avoidance of strikes and lock-outs. The whole of this collective system rests on the principle of mutual consent. This acceptance is purely voluntary depending solely on the sense of moral obligation. Loyal acceptance has in fact been the rule in all the trades concerned. Certain steps have, however, been taken in the interests of the community to encourage joint voluntary machinery where such does not exist and to assist where necessary in the settlement of disputes. There are 2 main legislative measures: the Conciliation Act, 1896, which was passed as a result of the recommendations of a Royal Commission of 1891, and the Industrial Courts Act, 1919. In addition, however, much has been done through the conciliation officers of the Ministry of Labour to strengthen and support existing joint machinery and to promote new voluntary machinery as organisation developed in industry (for details see under **ARBITRATION** and **CONCILIATION IN INDUSTRY**). The first modification of the voluntary principle was made by the Trade Boards Act, 1909, which set up Trade Boards empowered to fix minimum wage rates. This Act was confined to certain unorganised trades where 'sweated' conditions obtained, but the Act was extended in operation in 1918 by the Trade Boards Act of that year. Again, during the First World War, the Munitions of War Act, 1915, made strikes and lock-outs illegal so far as munitions work was concerned, unless the dispute had been referred to the Board of Trade which dept. could, in general, enforce arbitration, though it was understood that arbitration was merely supplementary to the agreements in various industries. Generally speaking, however, as the war progressed, arbitration became the practice, and this war-time national arbitration gave encouragement to the regulation of wages on a national basis during and after the war. But despite the legal prohibition of stoppages of work and the acceptance of compulsory arbitration, there developed industrial unrest throughout the country which seems to have had its origin in the shop stewards' movement and the theory of industrial unionism, notably on the Clyde and in Sheffield. The essence of this theory was devolution of authority to the workshop and the estab. of workers' control therein on militant lines with the ultimate object of securing control of industry generally. As a result of the recommendations of the Whitley Committee's Report there was an extension of the trade board system and the development of statutory machinery for the prevention and settlement of industrial disputes. The Committee laid down as an over-riding consideration 'the advisability of a continuance, as far as

possible, of the present system whereby industries make their own agreements and settle their differences themselves,' and this is still the deciding factor of state policy in regard to intervention in industrial disputes (see WHITLEYISM or WHITLEY COUNCILS).

During the Second World War the emphasis on the voluntary principle was maintained as far as possible in the Conditions of Employment and National Arbitration Order, 1940. This order prohibited strikes or lock-outs unless the dispute had been reported to the Ministry of Labour and had not been referred by him for settlement, and it also provided for the estab. of a National Arbitration Tribunal for dealing with disputes while laying down that if suitable collective joint machinery exists, the minister would refer the dispute to that machinery for settlement and that the settlement should have the legal force of an arbitration award.

The voluntary joint machinery for the regulation of terms and conditions of employment has evolved according to the varying needs and circumstances of the different trades and industries, but the better the industrial organisation the more effective and simple is the machinery of C. B. In the early days of C. B. negotiation was generally confined to localities, but in most industries the scope of the machinery has been continually extended until national negotiations have largely replaced local interchanges on industrial questions. National negotiating machinery, however, varies considerably in form and in degree of authority over the local machinery and, moreover, the trend towards national negotiation does not necessarily mean that a national uniformity has been estab. in regard to wage rates and conditions. Variety in the methods of C. B. as well as in wages structure is most to be found in industries where the principle of joint negotiation between organisations was well estab. before 1918. There is greater uniformity in industries where joint organisation is a more recent development and has been founded on the basis of the Joint Industrial Councils recommended by the Whitley Committee. C. B. between employers and workers' organisations may overstandardise the remuneration of workpeople who do work of varying importance and who are themselves of varying degrees of conscientiousness and ability. Particularly in a state of full employment, in which the bargaining power of workers' organisations is strong, C. B. may produce excessively high rates of pay (or other favourable conditions) for workers who, in the public interest should be employed elsewhere. Particularly also in state-controlled industries or services, such as railways, C. B. may produce agreement that satisfies the workpeople at the expense of the user of the services and the taxpayer. See INDUSTRIAL RELATIONS, WHITLEYISM. See also *Industrial Relations Handbook* H.M.S.O.; W. H. Hutt, *The Theory of Collective Bargaining*, 1930; *The Theory*

of Idle Resources, 1939; A. Beacham, *Economics of Industrial Organisations*, 1948.

Collective Security, concept which grew out of the Geneva conferences on disarmament after the First World War (see DISARMAMENT) and acquired an added emphasis during the Italo-Ethiopian war. Literally C. S. meant that, under the covenant of the League of Nations (see COVENANT OF THE LEAGUE OF NATIONS), the member states of the League should together guarantee the security of each individual member. When Mussolini threatened Abyssinia, a special committee on C. S. was formed with a view to curbing not only his aggressive designs but also to check the menace implicit in Ger. rearmament. Fundamental difficulties which had, however, previously arisen over the concept culminated in the fiasco of the League's vain efforts to prevent Italy from making war upon Abyssinia. For it now became evident that, even if the League could ensure resistance to a war of territorial aggression—and experience in 1939–40 was to show that it could not—it could not compel nations to compromise on issues which they felt to be vital to their national interests, and, generally speaking, no other issues really mattered. A further effort to construct a new system of C. S. through a series of multilateral politico-military alliances, all aimed against Hitler's policy of naked aggression, proved equally futile. On the constitution, functions, and powers of the Security Council of U.N.O., which has replaced the machinery of the covenant of the League, see UNITED NATIONS CHARTER.

Collectivisation of Agriculture in Soviet Russia, a process by which individual peasant holdings were fused into collective farms (see KOLKHOZ). The policy of C. of A. was embarked upon by the Communist party for a number of ideological, political, and economic reasons: the operation itself was described by Stalin as a 'revolution from above.' The collectivisation drive began in 1929 and encountered stiff opposition from the peasants, ranging from refusal to join the *kolkhoz* to uprisings, some of them extensive and protracted (e.g. in the Altay region of Siberia). The opposition was ascribed by Communists to the influence of the *kulaks* (see KULAK), and was overcome by combined administrative (confiscation of property, banishment), military, and economic measures (including the artificial famine of 1932–3). Seventy-one per cent of all peasant holdings were collectivised by 1934, and 93·5 per cent by 1938; instead of 26 million individual holdings (1929) there were 235,000 *kolkhozes* in 1937. The C. of A. finally estab. the power of the Communist party in the countryside and integrated agriculture with the rest of the socialised economy, but the cost in terms of human suffering and material losses was extremely high. The number of peasant households fell by 7 million to 19 million in 1937. More than a half of all horses (18·5 million) and cattle (36·7 million), and an even higher proportion of other livestock, disappeared

1928-33. Agric. output declined by 30 per cent and did not recover till 1938. Millions of peasants died of starvation or were deported and sent to forced labour camps. See also M.T.S. and NEO-POPULISM. See W. H. Chamberlin, *Russia's Iron Age*, Boston, 1934; N. de Basily, *Russia Under Soviet Rule*, London, 1938; A. Baykov, *The Development of the Soviet Economic System*, Cambridge, 1946; N. Jasny, *The Socialised Agriculture of the U.S.S.R.*, Stanford, 1949; D. Mitrany, *Marx Against the Peasant*, London, 1951.

Collectivism, word of modern origin, first used apparently by Bakunin to express the distinction between his tenets and those of Karl Marx, has since come to convey the same idea as Socialism, and is the theory that industry should be carried on with collective capital under the control of the community. See ANARCHISM; SOCIALISM; and INDIVIDUALISM; on the collectivisation of farms in Russia see COLLECTIVISATION OF AGRICULTURE.

College, in Rom. law, an association of persons for a specific purpose, a body of colleagues. The C. corresponded roughly with our corporation; it had to be incorporated by some public authority, springing from either senate or emperor. Collegia might exist for purposes of trade (cf. guilds), for religious purposes (e.g. C.s of augurs, pontifices, etc.), or for political purposes (e.g. *tribunorum plebis collegia*). By Rom. law a C. must have at least 3 members. With us a C. is an incorporation or society of persons joined together generally for educational, literary, or scientific purposes, and frequently possessing peculiar privileges. Such are the C.s of Oxford and Cambridge (see UNIVERSITIES), C. of Physicians, C. of Surgeons, Heralds' C., etc. Educational C.s seem to have grown out of the voluntary association of teachers and students at the univ. They seem to have been more numerous and flourishing than anything we know now; we hear of 300 halls or societies at Oxford, and 30,000 students. Men of wealth and culture, especially the political bishops and chancellors of England, obtained charters from the Crown for the incorporation of societies of scholars, and these gradually became the places of abode for students attending the univ. Later the univ. and the C. became co-extensive; every member of the univ. had to belong to some C. or hall, and was obliged to matriculate in the univ. The corporation consists of a head or master, fellows, and scholars. The governing body is the head and fellows. All eccles. or educational corporations have a visitor, whose duty it is to see that the founder's statutes are obeyed, and to decide disputed cases, provided they do not come under the common laws of the country or have to do with trusts attached to the C. The visitorship usually resides in the founder and his heirs or in the Crown. The fellowships, scholarships, etc., of C.s are subject to various restrictions, which are gradually being abolished. Some of the public schools are C.s, and many secondary schools are so called. In Scotland and in the U.S.A. the C. is not

distinguished from the univ., and we hear of C.s granting degrees. Many teacher training institutions throughout the world are called C.s. In the U.S.A. teachers' C.s award degrees.

Collège de France, founded in Paris by Francis I. about 1530, in opposition to the scholasticism of the univ. Erasmus was asked to be its principal, but he refused. It was first known as the Collège de Trois Langues, because originally the teaching embraced only 3 languages—Greek, Hebrew, and Latin. The univ. of Paris has frequently tried to obtain control, but without success. Until the time of the revolution it was regarded as a royal college. It is now under the control of the minister of public instruction, but is autonomous. There are no fees, no examinations, and no degrees or diplomas. Scientific research work is particularly encouraged. Its famous profs. have numbered Rollin, Saint-Hilaire, Laboulaye, and Gaston. At the present day there are over 40 chairs, and every branch of learning is taught. See C. P. Goujet, *Le Collège royal de France*, 1758, and Bouchon-Brandely, *Le Collège de France*, 1873.

College of General Practitioners. Founded in 1952 to help and encourage general medical practitioners in Great Britain to maintain a high standard of professional efficiency. It assists in the training of final-year students in general practice, and works in close collaboration with the Brit. Postgraduate Medical Federation to promote the further education of the general practitioner. The 22 faculties of the college in London and the provs., and the 5 others in the Commonwealth, arrange courses, symposia, lectures, ward-rounds, etc., for general practitioners. Another aim is the encouragement of research in problems of general practice. It is governed by a council; its constitution provides for members and associates. At present the college is administered from 14 Black Friars Lane, London, E.C.4; it is planned to erect a new building for the college in Lincoln's Inn Fields, London, W.C.2, by 1962.

College of the Sea, see SEAFARERS' EDUCATION SERVICE.

Colleges, Training, see TRAINING COLLEGES.

Collegiate Church (from Lat. *collegium*, assembly), one to which is attached a body of clergy, differing from a cathedral in that it is not the seat of a bishop. There were many on the Continent before the Reformation, the most famous one being that of Aix-la-Chapelle. After the Reformation nearly all of those in England were suppressed by Edward VI. Ripon and Manchester have since been constituted cathedrals for new dioceses. In Scotland the term is applied to a church which has 2 incumbents in the par.

Collembola, name given by Sir John Lubbock to the minute wingless insects known as spring-tails. Their chief characteristic is the power possessed by most of them of taking sudden leaps when alarmed, made possible by a curious apparatus on

the under part of the body. See Sir J. Lubbock, *Monograph of the Collembola and Thysanura*, 1873.

Colleoni, or Coleone, Bartolommeo (1400-1475), It. soldier, b. Solza, near Bergamo. In the war between the Milanese and Venetians his services were in great request by either side, and he fought for both. In 1446 he was imprisoned as a spy by Philip Visconti, Duke of Milan. In 1451 he definitely joined the Venetian army and became generalissimo of the Venetian state, when he showed his brilliant military talents. Near the church of SS. Giovanni e Paolo in Venice there stands an equestrian statue to his memory, executed by Andrea del Verrochio.

Colles, Abraham (1773-1843), Irish surgeon, b. Milmount, near Kilkenny. He qualified M.D. at Edinburgh in 1797. He was prof. of anatomy and surgery at the College of Surgeons, Dublin, 1804-36, and played an important part in establishing the reputation of the Irish school. His description (1814) of fracture of the carpal end of the radius led it to be called C.'s fracture. In his *Practical Observations on the Venereal Disease*, 1837, he stated that a child affected with congenital syphilis whose mother shows no signs of the disease will not infect her—a statement now known as C.'s law.

Colles, Henry Cope (1879-1943), musical critic; educ. at Royal College of Music and Worcester College, Oxford. He became assistant music critic to *The Times* in 1906, and chief critic in 1911. Wrote a number of valuable books on music and ed. the third and fourth eds. of Grove's *Dictionary of Music*.

Collesano, tn in Sicily (q.v.), 35 m. ESE. of Palermo (q.v.). Jasper and agate are quarried. Pop. 8000.

Collett, Jakobine Camilla (née Wergeland) (1813-95), Norwegian novelist, sister of the poet Henrik Wergeland. She was the chief exponent in Norway of the emancipation of women, and her writings deal largely with the suppression of a woman's personality in married life. Her novels give a realistic picture of Norwegian domestic life. Her first, *Ammandens Døttre*, 1885, is perhaps the best. Others are *Fortællinger*, 1861, *I de lange Nætter*, 1863, *Sidste Blade*, 1868-72, and *Mod Strømmen*, 1879, 1885. See A. Ben-terud, C. Collett, *En skjebne og et livsverk*, 1947.

Colletta, Pietro (1775-1831), It. statesman and historian, b. Naples. He entered the Neapolitan army in 1796, and later served with distinction in the army of Joseph Bonaparte. He was minister of war in the short-lived constitutional gov. of 1820, was subsequently imprisoned, but released, 1823. His great historical work, *Storia del Reame di Napoli dal 1734 sino al 1825*, 1834, was trans. into English in 1858 by S. Horner.

Colley, Richard, see WELLESLEY, MARQUESS.

Colli Euganei, see EUGANEAN HILLS.

Collio, tn in coal-fields, 122 m. from Perth, W. Australia. Pop. 8668.

Collio, sheep-dog used to protect and

control flocks. The Scottish C. is one of the most popular breeds, on account of the affectionate faithfulness it exhibits towards its owner. Renowned for its sagacity and intelligence, and with a snappy temper, it was formerly used chiefly in Scotland and N. England purely as a sheep-dog. During the middle of the last cent., and until the 1920's, it was popular as a domestic companion, and was seen in tns as frequently as on the mt side. Its popularity as a pet or show dog, however, has declined in recent years. There are 2 kinds of Scottish C.s, rough and smooth haired. The chief points to be looked for



T. Fall

ROUGH-COATED COLLIE

are a long head with a sharp nose; ears small, and folded back at the tips when in repose; eyes bright and dark, set obliquely somewhat close together; fore-legs straight; hocks bent; feet strong and round. The rough-coated variety should have a very thick, soft under-coat, hanging from which a long and wiry outercoat; a full mane and deep frill round the neck; fore-legs a little feathered; hind-legs smooth below the hocks; a long and bushy tail. The smooth-coated C. has no feathering on tail, ears, and legs; its coat is flat but thick. The average height for dogs is 22 to 24 in., for bitches, 21 in.; the average weight for dogs is from 50 to 65 lb., for bitches from 40 to 50 lb. The colour varies considerably, from black and tan, tan and white, sable and white, to pure white. The Welsh bob-tailed C. has a long, shaggy, blue-grey coat, and stands 25 in. high. Its tail is cropped when young. C.s are often crossed with black-and-tan setters.

Collier, Arthur (1680-1732), metaphysician, who wrote *Clavis Universalis, or a New Inquiry after Truth, being a demonstration of the Non-Existence and Impossibility of the External World*, 1713; *A Specimen of True Philosophy*, 1730, and *Logicology, or a Treatise on the Logos*, 1732.

Collier, Sir George (1738-95), vice-admiral, b. London. He entered the navy in 1751, and in 10 years was promoted to the rank of commander. He was appointed senior officer at Halifax, Nova Scotia (1776-9), and, when commanding the *Rainbow*, captured the Amer. frigate, the *Hancock* (1777). In 1797 he relieved

Penobscot and did much damage to the Amer. ships. He took part in the relief of Gibraltar, when he was successful in capturing the Sp. frigate, the *Leocadia* (1781).

Collier, Jeremy (1650-1726), divine, b. Stow-cum-Quy, Cambs, educ. at Caius College, Cambridge, and took holy orders in 1677. On leaving college he became rector of Ampton in Suffolk, and afterwards lecturer at Gray's Inn and preacher of the Rolls. He was an extreme high churchman, and at the revolution of 1688 refused to take the oaths to gov. For writing a pamphlet in defence of the de-throned monarch he was committed to prison, and again in 1692 for a series of pamphlets against William. In 1696 he pronounced abolition without confession on the scaffold at Tyburn to Friend and Parkyns, executed for plotting the murder of the king. For this he was outlawed, and he remained under the ban for the rest of his life. He now gave himself up principally to literary work. He issued essays upon many moral, religious, and political subjects, a vol. of practical discourses, and *An Ecclesiastical History of Great Britain, chiefly of England, 1708-14*. His famous treatise, *A Short View of the Profaneness and Immorality of the English Stage*, 1698, roused against him the violent opposition of the theatrical world, and led him into a long and triumphant controversy with Congreve and Vanbrugh.

Collier, John (1708-86), poet and painter, b. Urmston, near Manchester. In early life he was apprenticed to a Dutch weaver, but in 1729 obtained a position in a free school at Milnrow, near Rochdale, which he held till his death. He excelled in caricature-drawing and in rhyming satire. Under the name of 'Tim Bobbin' he pub. *The Blackbird*, 1739, *View of the Lancashire Dialect*, 1740, *Truth in a Mask*, 1757, *The Fortune-Teller*, 1771, 2 skits on John Whitaker's *History of Manchester*, in collaboration with Col. Townley, 1771, 1773, and a vol. of 26 humorous engravings, with rhyming descriptions, entitled *The Human Passions delineated*, 1772-3. See life by H. Fishwick, prefaced to his works, 1895.

Collier, John (1850-1934), painter, b. London. He was the second son of Sir Robert Porret C., afterwards Lord Monkswell, and was educ. at Eton and Heidelberg. He studied art at the Slade School and at Paris and Munich, and had some hints from Alma-Tadema and Millais. He exhibited at the Academy from 1877, and obtained considerable fame and popularity through his 'story-telling' pictures—e.g.: 'The Last Voyage of Henry Hudson,' 1881; 'A Glass of Wine with Caesar Borgia,' 1893; 'Urban VI' (under the torture-chamber window), 1896; 'A Confession,' 1902; 'The Prodigal Daughter,' 1903; 'Mariage de Convenience,' 1907; 'A Fallen Idol,' 1913. But his best work is in portraiture—e.g.: Rudyard Kipling, 1891; Prof. Huxley, 1891; Prof. Burdon Sanderson, 1894; The Duke of York (i.e. George V), 1901; Prof. E. Ray Lankester, 1904; Lord

Alverstone, 1912. He pub. works on the art of painting, including *A Manual of Oil Painting*, 1903, and *The Art of Portrait Painting*, 1905.

Collier, John Payne (1789-1883), Shakespearean critic, b. London. He was called to the Bar in 1829. His first pub., *The Poetical Decameron*, appeared in 1820; in 1825-7 he prepared a new ed. of Dodaley's *Old Plays*, to which he added 6 which had not hitherto been in print. Henceforward he devoted his life to the study of Elizabethan literature, but gave most of his time to the plays of Shakespeare. He issued *The History of English Dramatic Poetry to the Time of Shakespeare*, and *Annals of the Stage to the Restoration*, 1831; *New Facts; New Particulars*; and *Further Particulars on Shakespeare*, in 3 vols., 1835-9; an ed. of the poet in 8 vols., 1842-1844; and *Memoirs of Actors in the Plays of Shakespeare*, 1846. C. was one of the founders of the Shakespeare and Camden Societies, for which he ed. many old texts. In 1852 he pub. *Notes and Emendations to the Text of Shakespeare's Plays*, which caused a great sensation among Eng. and Ger. scholars. He possessed a copy of the 1632 folio, since known as the Perkins folio, because on it is inscribed 'Thos. Perkins his Booke.' C. asserted that the notes written in the margin of his folio dated from the middle of the 17th cent., and adopted them as emendations of the text. It was afterwards proved that the marginal notes were forgeries. These and other forgeries of his are carefully enumerated in Sir Sidney Lee's *Life of Shakespeare* (appendix i). C. also wrote a *Bibliographical and Critical Account of the Rarest Books in the English Language*, 1865, *An Old Man's Diary, Forty Years Ago*, 1871-2, and ed. 17th- and 18th-cent. reprints, and the works of Thomas Heywood and Edmund Spenser. See H. B. Wheatley, *Notes on the Life of John Payne Collier*, 1884.

Collier, Robert Porrett, see MONKS WELL. 'Collier's,' popular illustrated Amer. magazine, issued fortnightly, featuring articles and fiction, which was pub. at New York from 1888 until 4 Jan. 1957. Colliery, see COAL MINING and COAL SUPPLIES.

Collimation, adjustment of a telescope in such a manner that the line of sight (optical axis) is exactly perpendicular to the axis of movement. One common method of obtaining C. is by adjusting the telescope in its ordinary position, and when it is reversed in the bearings the angular discrepancy is noted, one-half of which gives the error of collimation. A collimator is an auxiliary telescope used to detect and correct errors in C.

Collings, Jesse (1831-1920), politician, b. Devon, was until 1879 head of the firm of Collings & Wallis, merchants, Birmingham. He became Liberal M.P. for Ipswich, 1880. It was C.'s Small Holdings amendment to the Address—an amendment involving the Radical scheme for 'three acres and a cow,' which secured in 1886 the downfall of Lord Salisbury's Ministry. Besides founding the Rural Labourers' League, and the National

Education League he played an active part in the municipal life of Birmingham.

Collingswood, bor. SE. of Camden, New Jersey, U.S.A., a residential tn. It manufs. leather products and thermometers. It was settled in 1862 by Quakers, and incorporated in 1888. Pop. 16,800.

Collingswood, Cuthbert, Admiral Lord (1750-1810), b. Newcastle. He went to sea when 11 years old, became lieutenant in 1774, was appointed commander of the *Badger* in 1779, and soon after post-captain of the *Hinchinbrook*. He served under his friend Lord Nelson in the Sp. main in 1780, and again in the W. Indies in 1783-6. In 1793 he was captain of Rear-Adm. Bowyer's flagship, the *Prince*. He was actively engaged under Howe at the great battle of 1 June 1794, and under Jervis off Cape St Vincent on 14 Feb. 1797. His extraordinary valour and judgment in these 2 engagements caused him to be held in great honour by the whole fleet. In 1799 he was made vice-admiral, and from 1803 he was constantly on active service. At Trafalgar he was second in command, his vessel, the *Royal Sovereign*, was the first engaged, and to him much of the honour of the victory was due. On Nelson's death he took supreme command of the fleet and was raised to the peerage. For 3 years his fleet maintained a blockade of Cadiz, the Straits of Gibraltar, and the adjoining coast. To the end of his noble life he remained, although worn out, at his post, his country refusing to release him.

Collingwood: 1. City in Bourke co., Victoria, Australia, situated on the R. Yarra-Yarra, and forming a NE. suburb of Melbourne. Pop. 35,000.

2. Lake port of Ontario, Canada, situated in Simcoe co., on the S. shore of the Georgian Bay, Lake Huron, 12 m. NW. of Toronto. It is a terminus for 2 lines of steamers from Huron to Lake Superior ports, and possesses a large dry-dock and shipyard. An important trade in grain and lumber is carried on, and there are numerous factories. Pop. 7646.

Collins, Arthur Pelham (1863-1932), theatrical manager, b. London, son of H. H. C., a city architect. Educ. at City of London School, and in Hanover. In 1881 he was apprenticed to Henry Emden, scenic artist at Drury Lane Theatre. He became stage-manager, and produced the dramas and pantomimes there, 1887-96. On the death of Sir Augustus Harris he obtained lease of the theatre, and became managing director of the limited company formed to work it. He produced all the dramas and pantomimes, 1897-1924.

Collins, Charles Allston (1828-73), painter and author, second son of Wm C., painter (q.v.). He married Kate, the younger daughter of the novelist Dickens, in 1860. In early life he showed much talent in his painting on pre-Raphaelite principles. In 1860 he pub. *The Eye-witness*, in 1862 *A Cruise on Wheels*, and various other works.

Collins, Cuthbert Dale (1897-), Australian novelist, b. Sydney. At the age of 14 he was general writer for a suburban paper

and later became dramatic critic of the Sydney *Bulletin*. Joining in a motor-yacht voyage round the world he wrote it up in *Sea-Tracks of the Speeljacks*, 1923. He followed this with a series of novels, including *The Haven*, 1925, *Idolater*, 1929, and *The Mutiny of Madam Yes*, 1934. In the Second World War he was a press censor. After it he pub. *Winds of Chance*, 1947, *The Happy Emigrants*, 1948, and an autobiography, *Bright Vista*, 1946.

Collins, John (1625-83), mathematician, son of a nonconformist divine, b. near Oxford and apprenticed to a bookseller there. He obtained a clerkship in the employment of John Marr, clerk of the kitchen to the Prince of Wales, where his immediate employer taught him mathematics. The outbreak of the civil war drove him out of the country in the service of the Venetian rep. Later he set up in London as a teacher, writing sev. works on merchants' accounts, the use of quadrants, geometrical dialling and mariners' plain scales. After the Restoration he was appointed successively accountant to the excise, accountant in chancery, and secretary to the council of plantations. He had a large family by one of the daughters of Wm Auston, head cook to Charles II and his means of subsistence became precarious; he d. in 1683 of asthma and consumption. An enlarged ed. of his *Doctrine of Decimal Arithmetick* had occupied his attention a year before his death. His *Arithmetick in whole Numbers and Fractions, both Vulgar and Decimal* was pub. by Thomas Plant in 1688. For his zeal in collecting and diffusing scientific information he was styled the 'English Mersenne' (q.v.).

Collins, John (1742-1808), actor and writer; he was a staymaker, but took to the stage, in which he was fairly successful. He pub. *Scripturapologia*, 1804, a book of verses. He is worthy of mention for the little piece, *To-morrow*, beginning 'In the downhill of life when I find I'm declining,' characterised by Palgrave as 'a truly noble poem.'

Collins, John Churton (1848-1908), literary critic, b. Bourton-on-the-Water, Glos. Educ. at King Edward's School, Birmingham, and Oxford, for many years he was a prominent univ. extension lecturer, and contributed regularly to the prin. reviews. His first book was a study of Sir Joshua Reynolds (1874) and later works included *Bolingbroke, a Historical Study; and Voltaire in England*, 1886, *The Study of English Literature*, 1891, *Illustrations of Tennyson*, 1891, *Jonathan Swift*, 1893, *Ephemeris Critica*, 1901, and *Studies in Shakespeare*, 1904. In 1901 he ed. Dryden's *Satires*, and he also pub. eds. of *Cyril Tourneur's Plays and Poems*, 1874, etc. See L. C. Collins, *Life and Memoirs of John Churton Collins*, 1912.

Collins, Michael (1890-1922), Irish revolutionary general, b. Woodfield, Clonsilla, co. Cork. He was the youngest son of a family of 8 of a farmer, John C., whose wife was 40 years his junior. He was educ. at a national school, and was employed in London in the post office and

afterwards in an accountant's office. In Easter week, 1916, he took part in the seizure of the Dublin G.P.O. (see *SINN FEIN*); after the failure of the 'rising' he was imprisoned in Stafford jail and in Frongoch camp, Merioneth, from which he was released before Christmas, 1916. In 1918 he was imprisoned in Sligo jail for sedition; in the same year he was elected parliamentary representative for co. Cork, and took his seat in the republican Dail Eireann. He assisted the escape of Eamon De Valera (q.v.) from Lincoln jail in 1919. C. was minister for finance in the gov. set up by the republicans, and also head of the intelligence dept. of the revolutionary army. By 1920 a reward of £10,000 was offered for his arrest, but he was noted for the fearlessness with which he went about and evaded capture. It was chiefly through the influence of C. that the Brit. treaty terms, which led to the setting up of the Irish Free State, were accepted by Dail Eireann. On the death of Arthur Griffith (q.v.) in 1922 C. became head of the Irish Gov. He entered into discussions with the N. Irish Unionists while at the same time fighting the republican irreconcilables in the Free State. He was ambushed by republicans and shot dead while motorcoring from Skibbereen to Cork on 22 Aug. 1922.

Collins, Mortimer (1827-76), novelist, b. Plymouth. For a time he taught mathematics in Guernsey. He settled in Berks to adopt a literary life, writing chiefly for periodicals, and also wrote occasional and humorous verse. His chief novels are *Sweet Anne Page*, 1868, *Two Plumages for a Pearl*, 1872, *Mr Carrington*, 1873, under the pseudonym of 'Robert Turner Cotton,' and *A Fight with Fortune*, 1876.

'Collins, Tom' (Joseph Furphy) (1843-1912), Australian novelist, b. Yarra Glen, Victoria. His parents were sturdy settlers of N. Irish stock who valued books and education. Taught first by his mother, he later attended Kyneton State School; he had a scholarly mind and read widely. By turns he was farm hand, prospector, engine expert, road contractor, and bullock driver. In his middle forties, he became a clerk in his brother's foundry at Shepparton where he began to write for the *Sydney Bulletin*, and to work on his novel *Such is Life*. This was finished in 1897 and pub. by the *Bulletin* in 1903 after a large section had been taken out. The discarded chapters, entitled *Right's Romance*, appeared serially in the *Broken Hill Barrier Truth*, 1905-6, and were pub. posthumously in revised form as a separate book in 1921. *Such is Life* is a novel about the human comedy as Furphy saw it when driving his bullock team up and down the country. Furphy writes with originality, vigour, and dry humour, his style is discursive, and he deliberately avoids any suggestion of conventional plot. In this book, the 2 streams of Australian writing, the Eng. literary tradition and the folklore of the Australian outback, enrich each other. *Such is Life* is an Australian classic which takes its place beside the great picaresque novels.

See Miles Franklin in association with Kate Baker, *Joseph Furphy*, 1944. See also AUSTRALIAN LITERATURE.

Collins, William (1721-59), poet, b. Chichester, son of a prosperous hatter. He became a scholar of Winchester, and there formed a close friendship with Joseph Warton. In 1740 he went to Oxford, matriculating from Queen's College, shortly before Warton went to Oriel, and the following year he obtained a demyship at Magdalen. He graduated in 1743 and then went to London in pursuit of a literary career. There he endured much privation and even suffered imprisonment for debt. Johnson befriended him, and he was intimate with Thomson. In 1749 he was relieved by an uncle's legacy, but it was too late, for he was too broken in health and spirits, and from despondency he fell into insanity and d. a physical and mental wreck at Chichester, in the home of his sister. The beginning of his melancholy began with disappointment over the reception of his poems, especially his *Odes*. Posterity has signally reversed the judgment of his contemporaries and has placed him at the head of the lyrists of his age. He did not write much, but all that he wrote is the precious outcome of a warm heart allied to a pure sense of beauty. His first pub. work was a small vol. of poems, including the *Persian* (afterwards called *Oriental*) *Elegies*, 1742; but his prin. work was his *Odes*, 1746 (dated 1747), including those to Evening and The Passions, which will live as long as the language. His other works are *Verses addressed to Sir Thomas Hanmer*, 1743, *Ode on the Death of Thomson*, 1749, *Dirge in Cymbeline*, 1749, and the unfinished *Superstitions of the Scottish Highlands* (written 1749; printed 1788, after discovery by Dr Alexander Carlyle). In poetical taste C. was in full sympathy with Warton, but so far outshines him that it may be assumed that Warton's critical work owes everything to C. and, if that be so, C. was the real innovator in literary criticism and the chief herald of the Romantic school. C.'s poetry is distinguished by high imaginative quality, and by exquisitely felicitous descriptive phrases. C.'s revival of obsolete words such as 'lorn,' 'westerling,' and others came naturally to him, were a genuine part of the dialect in which C. thought, and were a necessary revival if the language was to regain its power of true poetic expression. Historically, perhaps, the most remarkable of all C.'s poems is the *Ode on the Superstitions of the Highlands*, a most important poem in the early Romantic movement and the return of imagination to Eng. poetry. See memoirs prefixed to A. Dyce's ed. of the *Poetical Works*, 1827; M. Thomas's Aldine ed., 1858, 1894; H. W. Garrod, *Collins*, 1928.

Collins, William (1788-1847), landscape and figure painter, b. London. In 1807 he became a student at the Royal Academy, and in 1820 was elected R.A. He exhibited 121 pictures in 40 years at the Royal Academy, mainly incidents of everyday life with landscapes. 'As

the vicinity are stone quarries and brick works. Pop. 21,000.

Colne, riv. of England, rising in Essex near Haverhill, and flowing in a SE. direction, passing Halstead, Colchester, and Wivenhoe, to join the N. Sea at Mersea Is. Length 35 m.

Colne Valley, urban dist. of the W. Riding of Yorks, England, on the R. Colne 5 m. from Huddersfield. Two reservoirs of the Huddersfield water supply are at Marsden, which with Golcar, Linthwaite, and Slaithwaite makes up the dist., and a canal tunnel is in the neighbourhood. Silk, wool, and cotton milling are carried on. Pop. 22,184.

Colney Hatch, former name of a hamlet in Middx, now in the urb. dist. of Friern Barnet (q.v.). C. H. Asylum (opened in 1851) was formerly the name of Friern Hospital, now a mental hospital with accommodation for over 2300 patients.

Colobus (Gk *kolobos*, docked, stunted), genus of monkeys (guerczas), differing from other monkeys by the more or less complete suppression of the thumb. The C. inhabits the mt forests of central Africa, and is sought chiefly for the beauty of its skin which is jet-black, though the tail is white and the face brown.

Colocynth, or **Coloquintida**, see BITTER APPLE.

Cologna, It. tn in Veneto (q.v.), 21 m. SE. of Verona (q.v.). It has a trade in cereals, wine, and hemp. Pop. 10,000. #

Cologne (Ger. Köln; Rom. *Colonia Agrippina*), city and riv. port of Germany, in the Land of N. Rhine-Westphalia (q.v.), on the Rhine (q.v.), 20 m. SSE. of Düsseldorf. The main part of the city lies on the l. b. of the riv.

C. has been the chief tn of the Rhineland since early times, and although much of it was reduced to ruins during the Second World War it still retains many buildings of historic interest. Greatest of these is the famous archiepiscopal Gothic cathedral, one of the most splendid buildings in Europe. The corner-stone of the cathedral was laid by Archbishop Conrad of Hochstaden in 1248 on the site of an earlier church; the sanctuary was dedicated in 1322, the nave was ready for use in 1388, and the S. tower had reached a height of about 180 ft in 1447. The work was then interrupted for some 400 years. In the 19th cent. it was resumed, chiefly through the efforts of Sulpice Boisseree (q.v.) who prevailed upon the crown prince, afterwards Frederick William IV, to use his influence to have the building completed. Great popular interest was aroused, and all—Catholic and Protestant alike—contributed to the fund for carrying out the work, which was directed successively by the architects Zwirner (*d.* 1861) and Voigtel. The cathedral was finished in 1880, and the opening ceremony took place in the presence of William I and the reigning princes of Germany. The edifice covers an area of nearly 7400 sq. yds; its nave of 5 aisles is 445 ft long, and its transept, with 3 aisles, is 282 ft wide. The height of the nave is about 200 ft, and that of the 2 towers 515 ft. The imperial bell—the *Kaiserglocke*—which

weighed 543 cwt. and was cast from the bronze of 22 cannons taken from the French, was dismantled during the First World War, and was replaced by another bell weighing some 400 cwt. Among the treasures of the cathedral are the medieval gold reliquary of the 3 Magi (whose bones are supposed to have been brought here by the Emperor Frederick I in 1162), the 15th-cent. painting, 'The Adoration of the Magi,' by Stefan Lochner, and the 14th-cent. stained glass of the choir windows. The cathedral suffered considerable war damage, but the main structure survived, and the important contents, including the archives and library, were preserved.

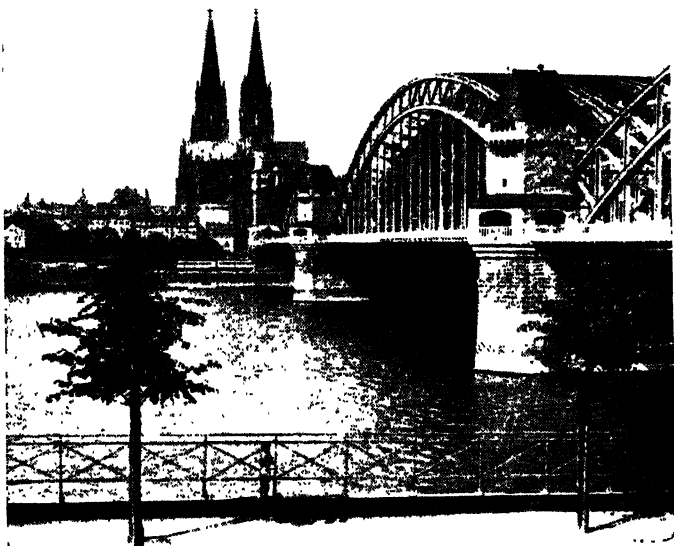
Before the Second World War C. had more than 100 churches. Some of these were destroyed by bombing; others were badly damaged but were capable of restoration. Among the ancient churches which still exist are St Pantaleon, a Romanesque basilica which contains the tomb of Bruno the Great (q.v.); St Gereon, which has a 10-sided nave, and which contains relics of St Gereon and of the 350 martyrs slain under Diocletian's persecution; St Ursula, in which are said to rest the bones of St Ursula (q.v.) and her companions; St Andreas, in which is buried Albertus Magnus (q.v.); and the Minorite church, where is the tomb of Duns Scotus (q.v.). The *Festhaus* of the Merchants of C., which was severely damaged by bombing, has been rebuilt, and it was decided also to reconstruct the Gothic *Rathaus*, of which only the Renaissance portico had escaped ruin.

The medieval limits of the city can still be detected in the semicircular avenues which mark the line of the old walls, and 3 of the ancient city gates still stand. Among relics of Rom. times are a 1st-3rd-cent. lower and the so-called 'Dionysius Mosaic'—the mosaic floor of a villa—which was discovered during excavations near the cathedral in 1941. In recent years whole streets of new buildings have been erected to replace those destroyed. Some of these modern buildings, in particular the commercial structures, are very fine. The Adenauer Hills, huge mounds of rubble covered with earth and planted with shrubs, are a feature of the city. C. is a cultural centre of great importance. Its univ., founded in 1388 and closed in 1798 by Napoleon, was refounded in 1919. There are also numerous academies giving instruction in the arts and in scientific subjects, and there are notable museums and botanical and zoological gardens. A famous folk festival is held each year before the beginning of Lent, and a trade fair is also held. The commercial importance of the city in modern times is largely due to its situation in a lignite-mining area and to its position as a centre of riv., road, and rail communications. Its chief industries are the manuf. of metals, machinery, textiles, beer, chemicals, and foodstuffs. Pop. 701,000.

History to 1919. C. was founded c. 37 bc by the Ubii, who were compelled by Agrippa (q.v.) to migrate from the r. b. to the l. b. of the Rhine. In AD 51 a colony of Rom. veterans was estab. on the spot by

Agrippina the Younger (q.v.), after whom it was named. In 308 a stone bridge across the riv. was begun by Constantinus I; this was later destroyed by the Normans. It was the seat of a bishop from very early times, and was made an archbishopric by Charlemagne (q.v.) in 785. For a long period the archbishop and the citizens were at variance, but municipal independence was finally estab. at the battle of Worringen in 1299. C. entered the Hanseatic League (q.v.) in 1201, and contended with Lübeck for pre-eminence. Until the 16th cent. it maintained a great

1918, and Sir Charles Fergusson made his formal entry on 11 Dec., and on 12 Dec. the Brit. troops took possession of the Rhine bridgeheads. Later, on the estab. of the commission, the regime of the governor was replaced by that of a general officer commanding-in-chief, with H.Q. in the famous Dom, Gen. (later Field Marshal) Sir Wm Robertson being the first commander-in-chief of the Rhine Army. The area of the Brit. occupation was about 1034 sq. m. and the civil administration was under the C. sub-commissioner of the Inter-Allied Rhineland



D. McLeish

COLOGNE, THE RHINE AND HOHENZOLLERN BRIDGE

commercial prosperity, but its fortunes then declined. It was incorporated with France at the peace of Campo Formio (q.v.) in 1797, but was assigned to Prussia in 1815 by the Congress of Vienna (q.v.). In the industrial revolution of the 19th cent. its prosperity again returned; large areas of the city were rebuilt and its boundaries were extended. The commercial importance of the city continued to increase throughout the cent.

History (1919-45). C. was garrisoned, after the armistice of 1918, by the Brit. Rhine Army of Occupation, and this occupation continued until 1925, when the forces were transferred to Wiesbaden. Previous to the setting up of the Inter-Allied Rhineland High Commission, the C. zone was placed under Sir Charles Fergusson as military governor. The Brit. cavalry patrols entered C. on 6 Dec.

High Commission, who was assisted by a number of Kreis officers. The civil administration was grafted on to the Ger. system, of which the Kreis, or dist., was the unit. Civil order was maintained partly by the Brit. military police and partly by the C. civil police. By the terms of the Rhineland agreement (which the high commission was called into being to administer) 75 per cent of the police had, for military reasons, to be recruited from the Rhineland area itself. The occupation of C. was, throughout, of a peaceful nature, and the Brit. regime was marked by a spirit of moderation. The Brit. military governor's first difficulty was in dealing with a series of strikes. The governor estab. arbitration courts, equitable solutions of labour troubles were found, and the time came when the Ger. workmen appealed to the Brit. authorities

as a matter of course, for the care of the commission throughout its existence was the ever-recurrent strike. Later, under the regime of the commander-in-chief, Brit. military courts were also set up, to try all offences committed within the occupied zone. These courts gave satisfaction, and a high tribute was paid to their sense of justice at the close of the occupation, and also to the orderliness of the occupation generally, by Dr Adenauer, the Oberbürgermeister of C., and Graf Adelmann, the Regierungspräsident, the high official responsible for the Ger. administration in the Brit. zone. A delicate period supervened when the Fr. and Belgian troops entered the Ruhr (see RUHR). The military and civil authorities in the C. area had to keep their zone free from incidents which were daily occurring in the Ruhr and in other parts of the Rhineland, as a result of the Ger. policy of passive resistance. The relations between the Brit. Army and the people of C. were always correct, and if there was no attempt by authority to promote social relations between the army and the inhab., it was because a service order was implicitly obeyed; but none the less as between the Brit. soldier and the *Hausfrau* of his billet in C. relations were cordial. One beneficial effect of this sequel to the war on C. was that, for the first time in its hist., the city was free from the fetters of fortress works. For, by the peace treaty, fortification of C. was prohibited, and the fortress works existing were accordingly razed. This gave the city municipal authorities a golden chance of getting clear of C.'s encircling bonds and so extending its developments laterally with the Rhine. This opportunity they were not slow to seize, as has been evidenced by the tn-planning and riv.-harbour schemes.

Bombing and capture of Cologne in the Second World War. C. was frequently bombed in the Second World War by the R.A.F., beginning with a heavy assault on the night of 13 Mar. 1942. On the night of 30 May 1942 over 1100 planes of all types were concentrated in a mass attack against the city lasting 90 min. It was a blow which devastated nearly one-tenth of the entire metropolitan area, practically destroying the old tn, and wrecking whole industrial areas. This raid cost the R.A.F. some 44 planes. There were 3 more devastating raids beginning 28 June 1942, in which the R.A.F. destroyed over 80 per cent of the central city area and 75 per cent of the other fully built-up dists. on the W. bank of the Rhine. In all about 80 factories were hit in the 3 raids. Railway communications also suffered, over 1000 wagons and 300 coaches being damaged. Cable works, shell-fuse factories, chemical works, and an aluminium foundry were hit. The factories of 3 well-known firms—Humboldt-Deutz, makers of internal combustion engines, lorries, and tractors; Gottfried Hagen, makers of accumulators and submarine batteries; and Felten & Guillaume, cable and wire hawser makers—were all badly damaged. Some 18 air-

craft were lost in a further night attack on 15 Oct. 1942. In the first 3 months of 1943 C., with its U-boat equipment plants, was raided sev. times. There was a higher proportion of heavy bombers in use than in the big raid of 30 May 1942, which meant that a greater weight of bombs could be dropped by fewer planes and with proportionally smaller losses. By the summer of 1943 there had been 116 raids on C., this being more than the number on any other tn in the Ruhr (Duisburg being next with 60 raids). There were yet more attacks in 1944, and by 1945 C. was over 60 per cent destroyed, with more than 2000 ac. laid in ruins.

Amer. forces began to advance towards C. in Nov. 1944, but were held up by Rundstedt's counter-offensive in the Ardennes. When this attack was checked the Allies launched a counter-offensive in the general direction of Bastogne-C. In Mar. (1945), while the Amer. Ninth Army was pushing to the Rhine in its sector, the First Amer. Army was exploiting its successful crossing of the Roer and thrusting towards C. In the First Army drive towards the city heavy opposition was for a time encountered E. of the Erft Canal, but the 3 Ger. armoured formations blocking the allied advance were dispersed by strong allied air attacks, and on 5 Mar. the advance elements of 7th Corps were entering C. By the afternoon of 7 Mar. the city was entirely in Amer. hands, the Ger. resistance having collapsed once the allied forces had reached the outskirts. This success had a profound effect on subsequent operations, as the divs. which would have been used to invest C. became available to assist in exploiting the great opportunity dramatically offered by reason of the Remagen crossing. (See further under WESTERN FRONT IN SECOND WORLD WAR; WORLD WAR, FIRST; WORLD WAR, SECOND.)

'Cologne Post,' see ARMY NEWS SERVICES.

Colomb, Philip Howard (1831–99), vice-admiral, inventor, and biographer, b. Scotland. In 1852 he saw active service in the Burmese war. He was the inventor of the system known as C.'s flashing signals, which has been adopted all over the world. He wrote *Essays on Naval Defence*, 1893, and other works.

Colombes, Fr. tn in the dept of Seine, a NW. suburb of Paris. It has the remains of a château where Queen Henrietta Maria (q.v.) d. There is a large sports stadium. It has chemical, oil, and food-processing industries. Pop. 61,000.

Colombia, NW. rep. of S. America. It is situated between 2° 40' S. and 12° 25' N. lat. and 68° and 79° W. long. It is bounded on the N. by the Caribbean Sea, on the E. by Venezuela, on the S. by Brazil and Peru, on the SW. by Ecuador, on the W. by the Pacific Ocean, and on the NW. by the Gulf of Darien. It is divided into 16 depts, 5 intendencias, and 3 commissaries. Its area is estimated at some 439,828 sq. m., and there are 1100 m. of coast on the Caribbean Sea and 1040 m. on the Pacific.

History. The earliest records of C. go back to about the year 1500, when the Sp. navigator, Alonzo de Ojeda, settled on the coast near the snow-covered range of Santa Marta, which had already been discovered by another Spaniard, Rodrigo de Bastidas. But the coast is generally said to have been visited in 1502 by Christopher Columbus—whence its name. This ter. was granted to Ojeda by the Sp. Crown, and soon after the portion adjoining was bestowed upon another explorer, Nicuesa. These 2 ters., called respectively Nueva Andalucia and Castilla de Oro, became united in 1514 into the prov. of Tierra-firma, with Pedro Arias

1811, when the revolution became formal, till 1821, when New Granada, Venezuela, and Ecuador became united under the name of C., incessant war was waged with that country. Union was effected by Simón Bolívar, but at his death in 1830 Venezuela and Ecuador seceded, and in 1831 C. called itself the Rep. of New Granada. It has remained much the same since then territorially, but with different constitutions and names.

Like all the reps. of S. America it is divided into 2 factions, the Conservatives, whose object is centralisation, and the Democrats, whose aim is decentralisation, with complete autonomy for each



De Wilson Popenoe

A TYPICAL ANDEAN ROAD NEAR FACATATIVA, COLOMBIA

de Avila as its governor. With the estab. of these colonies and the discovery of the South Sea by Balboa, a direction was given to the exploration of C. The large Rs. Atrato, Cauca, and Magdalena were explored and conquered in 1536-7. Quesada penetrated along the Magdalena as far as Bogotá, the chief tn then, and still the cap. To this part of the country the name of New Granada was given, and this continued to be the official name until C. won its independence. Next followed expeditions to the E. and SE. in search of the 'Gilded Man'—'El Dorado'; from these an extension of geographical knowledge was the only result. By the middle of the cent. Sp. power was fairly estab., and flourishing coastal tns were springing up. In 1563 New Granada formed part of the Sp. viceroyalty of Peru, but after many vicissitudes it was constituted a separate viceroyalty in 1751. Extreme measures of taxation and exorbitant duties provoked a revolt against Spain, and from

state. Up to 1886 its constitution was that of a federal rep.; at that date its states became depts. From 1889 to 1902 civil war was waged intermittently, and resulted in the triumph of the centralist forces over the revolutionaries. At the present day the executive authority is vested in a president elected for 4 years, assisted by a Cabinet of 6 ministers. Dr Laureano Gomez, the Conservative leader, was elected unopposed in Nov. 1949 and installed in Aug. 1950. He asked for sick leave in June 1953. Lt.-Gen. Gustavo Rojas Pinilla took over after a bloodless coup in June 1953, and exercised an authoritarian control over the gov. A rigorous gov. censorship on Colombian newspapers and news broadcasts was introduced, which was abolished when Gen. Rojas's dictatorship was suddenly overthrown in May 1957. A military junta took over the gov.

Topography. The surface of C. is varied. In the W. there are lofty mts; in the E. there are vast llanos and forest plains,

watered by tribs. of the Amazon and Orinoco. The mt system of the country consists of the 3 spurs of the Andes, which spring out fan-like from the plateau of Pasto in the SW.; these are the W., Central, and E. Cordilleras. Besides these chief ranges there are, in the N., the Sierra Nevada de Santa Marta and the low Bando range along the NW. coast and extending into Panama. The prin. rivs. are the Magdalena and its trib. the Cauca, rising in the Central Cordillera and flowing into the Caribbean Sea; sev. tribs. of the Amazon in the E.; and the Patia, flowing into the Pacific, after making its way through a gorge 10,000 to 12,000 ft high in the cliffs. One of the tribs. of the Patia, the Carchi or Upper Guatara, is spanned by the Rumichaca Arch or Inca's Bridge of natural stone. On the Rio Bogotá is the great fall of Tequendama, 480 ft high. Other rivs. are the Caquetá and the Putumayo. The climate of C. is determined by the double influence of lat. and altitude. Situated entirely in the tropical zone, its days and nights are of equal length, and it has 2 seasons—the wet and the dry. The country includes every altitude from sea level to upwards of 18,000 ft in the region of perpetual snow; it has therefore every temp., from that of the torrid zone to that of the frigid. The lowland portions, covered with dense forest, have an intensely hot climate; the inland mt region is comparatively cool. The wide-stretching plateaux of the E. Cordilleras have a cool and healthy climate. This region is the most thickly populated of the rep.; in it is Bogotá, the cap., 8694 ft above the sea. The climate of the ter. of Panama is exceedingly unwholesome, and in parts of the depts of Bolívar and Magdalena marsh fevers are rife. Sanitation is now being satisfactorily developed.

Government. In normal times Congress is composed of 2 chambers, a House of Representatives, elected by direct vote, and a Senate, elected (before 1945) by indirect vote, but, by an Act of 1945, the senators are now elected by direct vote of the electorate instead of indirectly by the departmental assemblies. Congress meets annually at Bogotá in July. Women, though conceded citizenship, are expressly debarred from voting (as are members of the army and the police) and from elective office.

The prolonged Panama dispute between C. and the U.S.A. was at last concluded in 1922. Panama had seceded in 1856, rejoined the rep. again, and again seceded in 1903. The U.S.A. recognised the independence of Panama, but it was not until 1922 that a treaty was ratified whereby the independence of Panama was estab., while C. received an indemnity of \$50,000,000 as compensation. There was another dispute in 1925, with Ecuador, arising out of a treaty recognising Peru's claim to sev. thousand sq. m. of ter. in the Amazon valley which Ecuador had ceded to C. In 1931 a boundary commission began the work of delimiting C.'s boundaries with Brazil and Venezuela as agreed by treaties, thus terminating

disputes of more than a cent.'s standing. In 1926 C. was elected to membership of the council of the League of Nations and is now a member of U.N.O.

Population, education, and religion. The pop. of C. is estimated at 12,600,000, of which only 160,000 are Indians. More than nine-tenths are whites and half-castes, and the chief centres of pop. are the upper valleys of the Magdalena and Cauca, where the climate is delightful and grain grows. The white pop. is of Sp. descent, and there are besides these the mestizos, of mixed Sp. and Indian blood, and the few Indians. Slavery was finally abolished in 1852. Primary education is, and has since 1870 been, free, but is not compulsory; and there are nearly 12,500 public elementary schools, with upwards of 650,000 pupils. There are 637 high schools with 26,500 pupils, and a number of vocational, agric., art, and religious schools; besides 63 colleges and 28 institutions of univ. rank, with 12,000 students. The National Univ. in Bogotá was founded in 1573; in the depts are 14 other univs., including Atlántico at Barranquilla, Antioquia and Pontificia Universidad Católica Bolivariana at Medellín, Cartagena Univ. at Cartagena, Cauca at Popayan, and Narino at Pasto. The chief tns are Bogotá, Medellín, Barranquilla, Cali, Cartagena, Manizales, Cúcuta, Bucaramanga, and Santa Marta. The state religion is Rom. Catholic. There are 4 archbishops.

Industries, minerals, etc. Chief industries are petroleum, agriculture, mining. The forests are extensive; there are mahogany, cedar, fustic, and other dyewoods, and there are medicinal plants. The prin. products are coffee, cotton, plantains and bananas, and, in some parts, tobacco, wheat, and other cereals. Banana exports in 1941 were over 2,250,000 stems, but owing to disease exports ceased in the following year, but in 1946 reached a total of 40,000 tons, and in 1954 reached a new record of nearly 8 million. C. is the largest producer of mild coffee, the demand for which is not affected by over-production in Brazil. Nearly two-thirds of the coffee goes to the U.S.A. Oil was discovered in 1922 and the chief wells are at Barrancabermeja on the Magdalena R., whence a pipe line runs to Cartagena, 360 m. away. The output in 1954 was over 39,900,000 barrels. The mineral wealth is great. There is a large ann. output of gold and silver, and rich deposits of copper, lead, mercury, iron, platinum, and salt (from the mines in Zipaquirá covering hundreds of sq. m.) are found. The famous emerald mines of Muzo and Cósquez are a gov. monopoly. The manufacturing industry is relatively unimportant, but in the larger tns many articles in common use are produced; among these are cotton textiles, shoes, hosiery, matches, sugar, liquors, flour, and bricks. The exports, in addition to gold, are coffee, petroleum, bananas, hides and skins, and platinum. The imports are textiles, machinery, metal manufs., cars and lorries, and chemical manufs. The value of trade in 1954

was: Imports, £240,000,000; Exports, £238,000,000.

Communications. In C. there are 1914 m. of railways, and some 15,000 m. of motor highways, but though some improvement has been made in recent years in railroad and wagon road communication and riv. navigation, railways and roads are still in their infancy owing to the mountainous terrain, which makes construction costly and difficult. There is a daily passenger and mail service between Bogotá and Barranquilla and extensive inland and foreign air connections. New

with 420,000 inhab. The harbour, which has an area of 1 sq. m., and is protected by 4 magnificent break-waters, affords shelter for 45 ocean-going steamers during the SW. monsoon and 39 during the NE. There are a graving-dock and a coaling depot. C. has broad streets with fine buildings and hotels. The business quarter, called Pettah, which is in the form of a bazaar, lies to the E. To the N. extends the quarter of St Paul, with extensive Catholic and Anglican colleges. Wolfendahl church, built in 1749, is the most interesting and complete of the few



Department of Information, Colombo

AERIAL VIEW—COLOMBO

Showing the Houses of Parliament and the Secretariat.

York can be reached in 2 days and mail gets to England a week or 9 days after leaving Bogotá. There are wireless stations at Barranquilla, Bogotá, Cali, and Cucuta. **Defence.** The navy consists of 2 destroyers, 3 frigates, and 32 other craft, with personnel 2600; the standing army consists of about 12,000 men. See G. Mollien, *Travels in the Republic of Colombia in the years 1822 and 1823* (trans.), 1824; H. Bingham, *Journal of an Expedition across Venezuela and Colombia*, 1909; P. J. Eder, *Colombia*, 1913; G. Arboleda, *Historia Contemporánea de Colombia*, Bogotá, 1919; R. B. Cunningham-Graham, *Cartagena and the Banks of the Sinu*, 1920; B. Nilca, *Colombia, Land of Miracles*, 1925; E. Taylor Parks, *Colombia and the United States, 1764-1934*, 1935; J. M. Henao and G. Arrubla, *History of Colombia*, 1938; W. O. Galbraith, *Colombia*, 1953.

Colombo, one of the finest and largest sea-ports of Asia, and the cap. of Ceylon,

relies of the Dutch occupation. A tor-toise said to have lived for 200 years is preserved in the museum in the Victoria Park, and a colossal stone lion on which the king sat to administer justice. The univ. in its various depts now caters for some 2400 students. C. is mentioned in 1346; the Portuguese took it in 1517 and named it C. in honour of Christopher Columbus. The Dutch took it from them in 1656 and surrendered it to the Brit. in 1796. C. is a port of call for all vessels bound for Australia, the Bay of Bengal, and the Far E. C. was raided by 75 Jap. planes, operating from carriers, on 5 April 1942. Low-level and dive-bombing attacks were made on the harbour and in the Rotnamada area.

Colombo Plan, plan for co-operative economic development in S. and SE. Asia, pub. 28 Nov. 1950, which came into effect 1 July 1951. Each member is free to revise its development programme as it

desires. Among its members are Britain, Australia, India, Canada, Ceylon, New Zealand, Pakistan, Burma, Indonesia, Japan, and the Philippines, and the U.S.A. is closely associated with it, attending meetings as a full member.

Colón, tn in Matanzas prov., Cuba, 45 m. ESK. of the tn of Matanzas. The chief industries are sugar, fruit, and tobacco processing. Pop. 11,550.

Colón, earlier Aspinwall, city, cap. of Colón prov., Panama, at the N. or Caribbean entrance of the Panama Canal. It is Panama's second largest city, built on Manzanilla Is. at the canal entrance, and a great commercial centre. Fruit and timber are exported. Its port is its twin city Cristóbal, which lies to the S. in the canal zone. It forms an enclave in the canal zone, but is linked to the rep. proper by a highway under Panamanian control. Pop. 52,000.

Colón, see COLITIS and INTESTINES.

Colón Archipelago, official designation of the Galápagos Is. (q.v.).

Colonel (It. *colonello*, leader of a column), in the Brit. Army, the chief commander of a regiment. In 1588 the title of C. was substituted for that of captain to designate the chief officer of a regiment. In the artillery and engineers the C. is always the acting commander, but his duties are performed by the lieutenant-C. in an infantry battalion or a cavalry regiment. In the latter cases the office of C. is a sinecure, but it is to be noted that this applies only to a regimental C. as distinct from a C. on the staff. A regimental colonelcy carried with it the pay of £1000 a year, and was given to a general on his retirement and as a reward for long service. But, as the result of a decision of 1888, this rule died out and only those having at that date a vested right to such an appointment came under the old order of things. Henceforth those officers only may become Cs who have received a brevet for distinguished conduct. There are besides certain appointments which carry with them the rank of C.; those of aide-de-camp to the sovereign, of assistant adjutant-general, and of commander of a regimental dist. being the chief. After the First World War the rank of C.-commandant displaced that of brigadier-general in the Brit. service, but in 1928 brigadier replaced C.-commandant. Cs of regiments are now selected from any officer of the rank of full C. and upwards who has served with distinction in the particular regiment. They retire on attaining the age of 70 years. At present C.-commandant of the Royal Artillery, Royal Engineers, etc., correspond somewhat to the C. of a regiment. In substantive rank they are general officers with distinguished service records. In the King's Royal Rifle Corps and Rifle Brigade they are equivalent to Cs of regiments. The rank of C.-in-chief of a regiment is an honorary office, and is held in various regiments by the sovereign and other members of the royal family, by foreign royalty and other persons.

Colonia, dept in Uruguay, on the Plata. There are fertile plains and valleys, which

are under cultivation. European colonists have settled there, and are engaged in stock-raising and agriculture. Area 2194 sq. m.; pop. 137,000. *C. del Sacramento*, on the Plata, opposite Buenos Aires, with which it is connected by a 35-m. ferry, is the cap., and possesses a fine harbour and an airport. Pop. 10,000.

Colonia Agrippina, see COLOGNE.

Colonial Agents, agents in England who act on behalf of Brit. colonies (see CROWN AGENTS FOR THE COLONIES). The agent-general represents a Canadian prov. or Australian state in London, and acts for the crown colonies. Most of the N. Amer. colonies before their separation had special salaried agents in England to superintend their affairs.

Colonial Civil Service. Service in the crown colonies, protectorates, and mandated ters. is by selection by the secretary of state for the colonies through the appointments dept of the Colonial Office. The service includes specialists in tropical medicine, agriculture, geology, law, entomology, engineering, forestry, etc. Some 20 per cent of appointments are made from Whitehall, the remaining 80 per cent, which includes most of the minor posts, by the local or colonial gov. concerned. The service is now unified with pay and conditions assimilated so that transfers from one colony to another may be made without loss of emoluments or pension rights.

Colonial Conference, African, first gathering ever held of the political leaders of Brit. colonial Africa, met at Lancaster House, London, in Oct. 1948. In all there were some 70 delegates, including chiefs from the 4 W. African colonies, emirs from Nigeria, tribal leaders from E. African ters. (including Tanganyika). Europeans representing the interests of trade and mines, and Arabs and Indians settled permanently in Brit. African colonies. The conference had 3 objectives: to give the delegates from different countries an opportunity to know each other, this being the first occasion on which W., E., and Central Africans, white and black together, had ever met in formal conclave; to enable African delegates to hear at first hand something of the problems, hopes, and expectations of the metropolitan power; and to discuss policies for education, improvement of agriculture, health, public relations, and economic development. The main purpose of the conference was achieved by enabling the delegates to return to their countries with a clearer idea of the difficulties, the knowledge that others shared their problems, and with the conviction that they were part of a greater community and had behind them the goodwill and the practical resolution of the Brit. nation.

Colonial Development Corporation (C.D.C.), public corporation estab. by Parliament under the Overseas Resources Development Acts, 1948 and 1956, for the purpose of assisting Brit. colonial ters. in the development of their economies. Members of the board of the C.D.C., consisting of chairman, deputy-chairman, and

from 4 to 10 other members, are appointed by the secretary of state for the colonies on a part-time basis. The general manager is chief full-time executive officer. The corporation is a commercial organisation and is required by the Acts to pay its way. It has powers to borrow its capital so that there shall not be outstanding at any one time more than £100 million on long-term and £10 million on short-term. There is no share capital and

The Corporation's head office is in London, with regional offices in Barbados for the Brit. W. Indies; Singapore for the Far E.; Nairobi for E. Africa; Salisbury, S. Rhodesia, for Central Africa; Lagos for W. Africa; and Johannesburg for the High Commission Territories.

Colonial Development and Welfare, policy of the Brit. Colonial Office in handling the economic and social problems of the dependent empire. In the



New York Times Photos

KING GEORGE VI WITH AFRICAN COLONIAL CONFERENCE DELEGATES
AT BUCKINGHAM PALACE

On the left of the king is Chief Nana Sir Tsibu Darku (Gold Coast); and on his right the Emir of Katsina.

the loan money has been obtained from the Treasury; interest has to be paid over the life of each loan at the rate current at the time of each advance. On long-term loans interest payments are postponed for the first 7 years; loans and interest are repayable by 33 annuities starting in the eighth year. At the end of 1956 the Corporation had 66 development projects in hand for which the total capital approved was £75 million. Projects cover all forms of economic development, including agriculture, animal products, factories, fisheries, forestry, hotels, minerals, housing, power, transport, and communications. They are situated in 22 different colonies.

last decades of the 19th cent. the issue appeared to be simple, for in every country, Burma, Malaya, W. or E. Africa, the Pacific Is., bloodshed and slavery had been replaced by peace, freedom, order, and justice. But early in the 20th cent. an expanding electorate began to demand drastic measures to cure the economic and social dislocations accompanying their industrial revolutions. That demand has, in course of recent years, been voiced on behalf of colonial peoples in accordance with the Brit. conception of trusteeship in relation to native people (see COLONIAL TRUSTEESHIP). The colonies suffered from lack of capital. With few exceptions Brit. capital has avoided the colonial empire

and favoured more lucrative investment in foreign countries. Of public loans raised by colonial govts. some 75 per cent has been devoted to railway and port developments, and the colonies have had the benefit of rates of interest only slightly higher than internal U.K. loans. The colonies need more capital for development and social services. The ters, which can attract capital by rich mineral and other natural resources are few. The rest are poor countries struggling under a burden of tropical diseases, malaria, yaws, leprosy, beriberi, and so forth; crop pests, leaf spot, the ruin of banana crops, and locusts; malnutrition, isolation, and ignorance. In these areas an adequate standard of living—reasonable immunity from disease, a wholesome diet, improved education, housing, and transport—has not yet been achieved. Such ters, could make little headway within the limits of their own revenue resources. In 1929 a Colonial Development Advisory Committee was appointed by the secretary of state for the colonies, under the authority of the Colonial Development Act, 1929. Its function was to consider and report on applications for assistance from the Colonial Development Fund, in furtherance of schemes likely to aid and develop agriculture and industry in the colonies, protectorates, and mandated ters. Assistance was given for deep-water harbours; afforestation; hospitals and hospital equipment; improved medical services; schools for European and native children; malarial research units; public health schemes; railway development; housing schemes for natives; stations for coffee and sisal research and research into plant ecology; factories; new telegraph and telephone units. But the amounts obtainable under this Act were restricted. Early in 1940 the Brit. Gov., which had made special grants for technical research and grants in aid to help hard-pressed colonies to balance their budgets, passed the Colonial Development and Welfare Act, which authorised expenditure up to £5 million a year for 10 years, and an additional grant up to £500,000 a year for research. At the same time some £10 million worth of loans previously advanced to the colonies was cancelled. In 1943 a Colonial Products Research Council was set up to deal with research for which the £500,000 a year had been allocated. An Act passed in 1945 extended the grant period from 1951 to 1956, more than doubled the rate of expenditure, and abolished the practice of surrendering the unexpended portion of the ann. grant to the Brit. Treasury. Later Acts in 1949, 1950, and 1955 further extended the provision. Grants under the 1940 Act totalled £10.4 million. Grants and loans approved under the subsequent Acts had by 31 Mar. 1956 reached the total of £162 million, of which nearly £118 million had actually been issued. Aid to education totalled nearly £30 million; over £20 million had been allocated to agriculture and veterinary services and to roads, £18 million to medical and health services, £14 million to

water supplies and sanitation. Research schemes of various kinds received 14.7 million. Nigeria, with allocations of £35 million, was the largest benefiting ter. The present provision of money for C. D. and W. remains in force until 1960. Ghana (Gold Coast) and the Federation of Malaya on becoming independent ceased to be eligible for aid under the Acts. See COLONIAL CONFERENCE, AFRICAN. See Lucy Mair, *Welfare in the British Colonies*, 1944; *Social Policy in Dependent Territories* (International Labour Office); Sir Keith Hancock, *Wealth of Colonies*, 1950, and *Colonial Self-Government*, 1952; Roy Lewis, *Ten Years of Development and Welfare*, 1956; Sir Ivor Jennings, *The Approach to Self-Government*, 1956; P. T. Bauer and B. S. Yamey, *The Economics of Undeveloped Countries*, 1957.

Colonial Law. The law to which a colony becomes subject depends on whether it was acquired by settlement, conquest, or cession. Eng. subjects have normally carried no more of the Eng. law than was adapted to the circumstances of the infant colony, e.g. the Mortmain Acts (q.v.) were held inapplicable to New S. Wales, the Marriage Acts to India; but the Bankruptcy Act, 1882, has been held to be of universal application. The Eng. eccles. law applies to settled colonies because they have no estab. church. The sovereign has power by Order in Council, or by charter of justice under the Great Seal, to make new laws. But having once granted legislative powers to a colony, he ceases to have legislative power in regard to local matters. By the Colonial Laws Validity Act, 1865, every colonial legislature had power to establish courts of judicature, and to make laws respecting the constitution, powers, and procedure of such legislature. A change in the operation of dominion legislation, especially in the direction of giving such legislation extraterritorial effect, was foreshadowed by the decisions of the Imperial Conferences, 1926 and 1930. The sequel was the Statute of Westminster, 1931. The Colonial Laws Validity Act, 1865, no longer applies to any law made after 1931 by a dominion Parliament. A dominion Parliament now has power to repeal or amend any Act in so far as it is part of the law of the dominion. No Act passed after 1931 will apply to a dominion unless it is expressly declared in the Act that the dominion consented to its enactment. Australia delayed adoption until 1942, when by an Act of that year it adopted the material sections with effect from 3 Sept. 1939. New Zealand, in 1946, set up a committee to consider the question and the effect on the laws of New Zealand. Newfoundland (q.v.) has joined the Confederation of Canada. The report of the conference of 1929 on the operation of dominion legislation also considered the advantages of a commonwealth tribunal as a means of determining differences between members of the Brit. Commonwealth; and the Imperial Conference agreed that the tribunal should be constituted *ad hoc* in the case of each dispute

to be settled. No such tribunal, however, has yet been convened, though the Brit. Gov. offered to refer the Irish land annuities dispute to such a body (see DE VALERA, RAMON; IRELAND, REPUBLIC OF). The states which have most readily availed themselves of the Act are those like the Union of S. Africa and Ireland, in which there is a strong republican or nationalist element hostile to continued membership of the Commonwealth.

Colonial Office. In England the earliest separate organisation for the administration of colonial affairs was a committee of the Privy Council appointed by the king in council in 1660 'for the Plantations.' By 1695 certain limited powers in regard to the colonies were vested in a commission known as the Board of Trade and Plantations, but the executive work was done by the secretary of state for the S. dept. In 1794 the secretary of state for war had assumed control, but in 1854 the outbreak of the Crimean War led to the appointment of a secretary of state for the colonies to relieve the war secretary of colonial business, and the secretariat for the colonies has continued a distinct dept ever since. The importance of the office was greatly enhanced under the secretaryship of Joseph Chamberlain at the end of the last cent. After the First World War a Middle E. dept was set up to deal with business relating to the mandated ters. of Palestine and Mesopotamia (renamed Iraq, q.v.). In 1925 a new secretaryship of state for dominion affairs was created, and as a result the Dominions Office (now Commonwealth Relations Office) was formed to take over from the C. O. business connected with the self-governing dominions, the Irish Free State (now Rep. of Ireland), the self-governing colony of S. Rhodesia and the S. African ters., Basutoland, Bechuanaland, and Swaziland, and business relating to the imperial conferences (see IMPERIAL CONFERENCE). For some years both secretaryships were held by one minister, but in 1930 a separate minister was appointed to the dominions secretariat, with a separate parl. under-secretary. The administrative powers of the colonial and commonwealth relations secretaries do not embrace the Channel Is. and the Isle of Man, which are under the Home Office. But with these exceptions the 2 secretaries of state are responsible for U.K. relations with the whole of the Brit. oversea dominions, colonies, protectorates, etc. Colonial governors are appointed by the Crown on the recommendation of the secretary of state for the colonies, while some other executive and all judicial appointments are made directly by the secretary of state. In recent years, especially since the close of the Second World War, the staff of the C. O., consistently with the advance of public opinion on the economic development and social welfare of the colonies, has been considerably expanded, especially in the number of its specialist advisers on development planning, agriculture, animal health, education, engineering appointments, fisheries, forestry, and labour. The enhanced importance of

economics and sociology in the administration of the colonial empire is reflected by the new depts—commercial relations and supplies, finance and development, research, social service, and welfare. See COLONIAL DEVELOPMENT AND WELFARE. See Sir Charles Jeffries, *The Colonial Office*, 1956.

Colonial Trusteeship. In the broader sense the concept of C. T. originates in Burke's famous declaration, in his speech on the India Bill, 1785, that Britain had become directly responsible for the welfare of the Indian peoples 'as a sacred trust.' Acceptance of that principle laid the foundations for the 19th-cent. Brit. doctrine of C. T. With varying degrees of success it led to self-gov. for India and elsewhere. In the Brit. colonial empire proper (i.e. as opposed to the dominions) the principle was implicit in the long political campaign for the abolition of the slave trade and, later, of slavery in the Brit. W. Indies and, under Sir John Kirk's influence, in E. Africa, where the Arab slave trade was the chief factor in directing Britain's attention to that region (consult R. Coupland, *The Exploitation of East Africa*, 1939, and also *The British Anti-Slavery Movement*, 1933). Sierra Leone illustrates the principle, for the original settlement was formed for the benefit of liberated African slaves in 1792. Reinforced by a growing interest in Christian missionary effort, the movement for the abolition of slavery led the nation as a whole to accept a new standard of conduct towards subject peoples. In the Brit. tropical dependencies in Africa the doctrine gained fresh impetus from the classic work, *The Dual Mandate*, by Frederick (later Lord) Lugard (1929), which urged that the white man's trust had a dual purpose: the development of indigenous resources for the benefit of all nations, and the promotion of native welfare. Trusteeship is also implied in the principle of 'indirect rule,' which owes much to Lord Lugard (see INDIRECT RULE). C. T. is also illustrated in the administration of Kenya in the principle of the 'paramountcy of native interests' as enunciated by the Devonshire White Paper of 1923, which stated that 'if and when the interests of the African natives and the interests of the immigrant races [i.e. the British, Indians, Arabs, and others] should conflict, the former must prevail. . . . But it has always been made clear that the paramountcy of native interests is not to be interpreted as justifying neglect of the vital interests of the European community, and that the ultimate trusteeship of the imperial gov. does not preclude the grant to that community of a share in the gov. of ters. which they have made their home. The Churchill White Paper of 1927 dealt with these 2 points by enunciating the principle of the 'dual policy' of economic development—increasing native production in the native reserves *pari passu* with that of European plantations—and the imperial gov.'s 'desire to associate more closely in the high and honourable task [of trusteeship] those who, as colonists or residents,

have identified their interests with the prosperity of the country.' The principles implicit in the concept of C. T. have received practical application in recent years in the form of extended social services and colonial welfare generally, through the operation of the provisions of the Colonial Welfare and Development Act, 1940. Trusteeship, on the political side, and the dual mandate on the economic, have in these days been merged in the more constructive relationship of senior and junior partners. The principle of C. T. is also implicit in the concept of mandates (*see* MANDATE SYSTEM).

United Nations' Declaration on Colonial Policy and the International Trusteeship System. During the 1930's when the possession of colonies was one of the causes of international friction, some publicists and politicians thought the solution of what was known as 'the colonial question' lay in bringing all colonies alike under some form of international control, so as to ensure that the non-colonial powers could enjoy the same range of economic opportunities as the colony-owning powers. But in the preoccupations of the Second World War the matter ceased to excite any special interest, though interest revived to some extent through Amer. criticisms of Brit. 'imperialism.' The more dispassionate section of Amer. public opinion, however, could not accept the Brit. conception of C. T. where the trustee was not accountable to some third party's judgment, i.e. some international body after the manner of the Permanent Mandates Commission. As confidence in victory deepened towards the later stages of the war, the opinion in Britain strengthened that no form of international intervention in the administration of the colonies could be tolerated.

The San Francisco decisions of 1945 (*see* SAN FRANCISCO CONFERENCE) respecting colonies were a compromise between the more extreme points of view. The conference drew a clear line between the treatment of the colonies proper and of those areas which were held under mandate or which might at any time be brought under a similar regime. The conference (*see* UNITED NATIONS CHARTER) did not propose to subject colonies to any system of control—probably it bore in mind Churchill's declaration that what Britain had it held, and that he did not think he had been called upon to be Prime Minister in order to preside over the liquidation of the empire. The U.N. Charter restricted itself to an agreed declaration on colonial policy, which recognised that the interests of the colonial peoples are paramount and commits the colonial powers to promote self-gov. This declaration contains nothing new to Brit. colonial policy and would seem almost to be modelled upon that policy, especially as the charter concedes the principle that progress in free institutions must evolve in harmony with social and economic advance. The charter does, however, require that colonial powers should regularly transmit to U.N.O. statistical and other information

regarding colonial conditions. The element of third-party control is limited to ters. to be brought under the international trusteeship system, i.e. ters. then held under mandate; those which might be taken from enemy states after the war; and those which might be voluntarily put under the system by the states then controlling them. Assuming that Britain would decline to offer any part of her colonial empire for inclusion in this system, the areas which would come under it would in terms of pop. be under one-tenth of the whole Brit. colonial empire.

The international trusteeship system differs from the mandatory regime. The Trusteeship Council, which replaces the Permanent Mandates Commission, is composed of member states administering trust ters., major signatories not holding such ters. (at that date these were U.S.A., U.S.S.R., and China), and such number of elected member nations as would ensure that trust-administering nations were not in the majority. Each member nation nominates one qualified person to be its representative; whereas in the old mandatory system there was no rule prescribing the countries which should nominate members, and it was a recognised convention that the commission's members should be regarded as individuals exercising an independent judgment, not as national representatives.

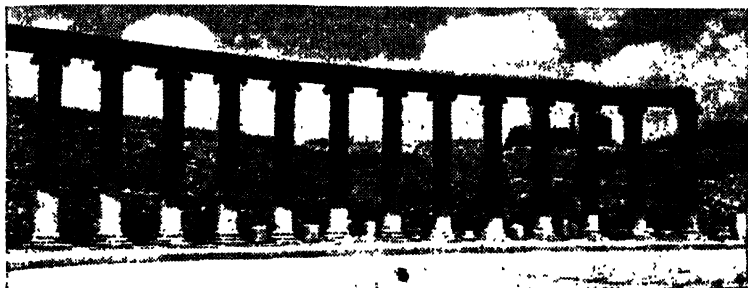
The council's stated functions on receiving petitions and information are not wider than those of the old commission, save that the council has formal authority to provide for periodic visits to the trust ters. But there is a change in the way in which ters. may be brought under the new system: each is to be the subject of a separate agreement, which is to be made by 'the states directly concerned,' including a mandatory power, and approved by the U.N. The object of this arrangement is to secure flexibility in the terms of the trusts over ex-enemy ters., but it may cause difficulties in securing agreements between a mandatory and the 'states directly concerned,' whose identity is obscure. These agreements, however, are to be made within the framework of the declared objectives of the trust system, which indeed are similar to those of the colonial charter or declaration. But 2 points of practical significance arise in relation to certain limitations on the old mandates, viz. the prescription of the obligatory open door in A and B mandates—applicable to tariffs, investment of private capital, and immigration—and the prohibition against raising forces locally or constructing fortifications or bases except for purely local defence. The trust system maintains the open-door principle, though it does so in such terms as imply a possible departure in the interests of the people of the ter.; but the restriction on fortification is discarded. Despite all that the charter may be designed to achieve, it is probable that experience will show that, as in the past, 'the sure guarantee of the interests of the peoples of mandated ters. lies in the character and conscience of the administering

authority.' See COLONY; INDIRECT RULE; MANDATE SYSTEM.

Colonies, Zoological, are formed when an organism gives rise to sev. buds which adhere to the parent and continue to reproduce after this manner. Such colonies, occasionally found among the Protozoa, are very usual among the Porifera or sponges, and among the Coelenterata the fresh-water *Hydra* forms such an aggregate of individuals temporarily, while many other forms, e.g. dead men's fingers, or *Alcyonium digitatum*, and most corals, are permanently colonial. In many cases the individuals which make up a colony perform identical

condottiere. After having been a soldier in his youth, Pompeo C. entered the Church, and was made Bishop of Rieti in 1508. For inciting the people to revolt against Pope Julius II he was deprived of his office, but was pardoned by Pope Leo X, and created cardinal in 1517. Later he helped the emperor in his attack on Rome in 1526, but was subsequently pardoned by Clement VII and made viceroy of Naples.

Colonna, Prospero (1452-1523), It. condottiere who offered to help Charles VIII of France when that king invaded Italy in 1494-5. He was an extremely able general, and later on entered the



E.N.A.

A COLONNADE: THE FORUM, JERASH, JORDAN

functions, but in the condition known as polymorphism the functions are specialised and allotted to various persons. Thus the individuality of the members is frequently lost, and they become almost like organs instead of whole living creatures.

Colonna, name of one of the oldest and most illustrious families of Italy, which has produced popes, cardinals, princes, and generals, and belonged to the Ghibelline party.

Colonna, Fra Francesco, Dominican, b. Venice. He is famous chiefly as the writer of a mysterious allegorical romance, *Hyperotomachia Poliphili* (q.v.), which would probably have been forgotten but for a rare ed. with engravings by Giovanni Bellini and for Paul de Saint Victor's illustrations. An abbreviated version of this romance was pub. by Sir Richard Dallington in 1592 under the title of *The Strife of Love in a Dream*. See also Linda Fierz-David, *Der Liebestraum des Polifilo: ein Beitrag zur Psychologie der Renaissance und der Moderne*, Zürich, 1948.

Colonna, Giovanni Paolo (1637-95), It. composer, b. and d. Bologna. He composed church music, oratorios, and operas. On 4 occasions he was elected principal of the school of music at Bologna. Some of his compositions are still in MS. at Bologna and some at Vienna, but a fair number of them were printed in 1681-94.

Colonna, Pompeo (c. 1479-1532), It. cardinal, nephew of Prospero C., It.

service of the Pope, and among his many victories he won the battle of Vicenza in 1513 against the Venetians, and the battle of Bicocca in 1522 against the Franco-Ger. forces under Lautrec.

Colonna, Vittoria (1492-1547), Marchioness of Pescara, daughter of Fabrizio C. She was betrothed at the age of 4 to Francisco d'Avalos and was brought up in the mansion of Costanza d'Avalos, Francisco's aunt, where Tasso and most of the intellectual men of the time were constant guests. She was remarkably beautiful, highly intellectual, and well educ.; her first poetry was written at an early age. From 1512 she led a very lonely life, her husband being absent with the fighting army; he is the one subject of her verse during this time. After his death she lived in retirement, often in convents. Michelangelo, between whom, in his later years, and C. existed a warm friendship, wrote some of his finest sonnets to her. The *Rime spirituali* are her most characteristic poems, many of them idolising her dead husband.

Colonna, Cape, see COLONNES.

Colonnade, one or more ranges of columns symmetrically disposed, in front of, surrounding, or inside, a building.

Colonne, Guido delle, Giles, or Gilles de Colonne, Egidio Colonna, or Aegidius Romanus (d. 1316), It. theologian and writer, b. Rome. He became tutor to the dauphin of France, Philippe le Bel, for whose use he wrote a treatise entitled

De Regimine Principum (pub. in folio at Rome in 1492). In 1292 he was elected general of the Augustinian order, and later became Bishop of Bourges. He was an exceedingly learned man, and was called by his contemporaries 'the well-founded doctor.' He wrote sev. books on philosophy and divinity. A life of him by Angelo Roeha is prefixed to an ed. of his work, *Defensorium*, pub. at Naples in 1644.

Colonne, Capo Delle, see LACINIUM.

Colonnas (Colonna), Cape (It. 'column'; formerly Sunium), most southerly point of Attica, Greece. At the cape's extremity are ruins of a temple (269 ft above sea level) dedicated to Poseidon, of which 12 marble columns still stand, and from these the tn derives its name.

Colonsay and Oronsay, 2 Inner Hebridean is. off Argyll, Scotland. C. is 8 m. by 3 m., and has a college founded by St Columba who landed at Oronsay from Ireland in 563 and afterwards removed to Iona. There are extensive remains of a priory founded in the 14th cent. Pop. 230.

Colonus, or **Kolonos Hippios**, site in Attica, Greece, about 2 m. NW. of Athens. Sophocles was b. there, and immortalised it by the description which he gave of it in the *Oedipus at Colonus*. Two most famous archaeologists, Charles Lenormant and Otfried Müller, are buried in the cemetery upon the hill-top.

Colony (Lat. *colonia*, from *colere*, to till), name applied to a country which is peopled by immigrants, who remain subject to or connected with their parent state. The anc. Greeks colonised extensively along the coast of Asia Minor, Thrace, S. Italy, N. Africa, Sicily, and the Crimea; a Gk C. was called *apoikia*, and the colonists *apoikos*, i.e. literally 'people from home.' The cause of emigration from Athens was usually political dissension. The band consulted the oracle and chose a leader, called *oikistes*, who took sacred fire from the Prytaneum, that the new city might be patterned after the *metropolis*. The city thus founded was entirely self-governing and independent, and was connected with Athens only by ties of sentiment and religion. The *kleroukia*, literally 'allotment,' on the other hand, though it had a certain amount of internal self-gov., remained in close connection with the mother city, the citizens being recognised as Athenian citizens. The Romans, who were a great colonising race (strictly speaking a *colonia* is a farm, or cultivated land, but the meaning was extended to embrace any public settlement of Rom. citizens, and later it acquired a military sense), began their C.s in the neighbouring cities. Whenever Rome conquered or acquired new ter., she left behind her a handful of citizens to act as a garrison. These citizens were frequently veteran soldiers. They were given the land as a reward for past services, and had to answer to Rome for the loyalty and good behaviour of the *colonia*. The Romans had a genius for organisation and administration. Some C.s were rewarded with the high privilege

of Rom. citizenship, while others remained dependencies, and still others grew into large Rom. provs. The gov. was modelled on the republican gov. of Rome, and the C.s were governed by the same kind of officials. The highest men in the state were rewarded with the governorship of a prov. or C.

After the fall of Rome, C.s were not heard of again till early in the 16th cent., when Spain and Portugal took the lead in establishing C.s, followed closely by England, Holland, and France. During the Renaissance men were inspired by a high, adventurous spirit. Those who came back across the Atlantic filled the minds of their fellow countrymen with stories of a wonderful land, where great quantities of gold might be found. The possibilities of the New World seemed to be unlimited, and every country which had any maritime power wished to be there first and possess the best of everything. Portugal had, as early as the 15th cent., placed trading factories along the W. coast of Africa, which she later extended as far as India. Portugal now developed her empire in S. America, as well as in Africa, her great rival in the former country being Spain. The C.s of Spain and Portugal were directly subject to the gov. at home; they were ruled by highly paid, self-seeking officials, whose one ambition was to make so much out of the new country that they might return home enriched with their gains. The Sp. colonists were chiefly engaged in mining. The Portuguese aimed at placing factories at convenient ports for trading purposes. Neither country aimed at cultivating the land it had seized, and neither was successful at ruling the natives or at settling down and making a home in the new conditions. By the end of the 18th cent. Portugal had lost everything except a few tns of little note in India, a strip along the coast of Africa, Brazil (q.v.), which later asserted its independence and became a rep. (1822), and Macao (q.v.). Spain eventually lost her possessions in S. and Central America during the 19th cent., and her other C.s she ceded to the U.S.A. after the war of 1898-9.

The earliest Brit. C. was Newfoundland, annexed by Sir Humphrey Gilbert in 1583. During the 16th and 17th cents. Great Britain was urged to send her sons across the seas by a spirit of rivalry with other European states. But other causes sent them to the New World. Religious differences led to the sailing of the *Mayflower* from Plymouth to New England in 1620. The settlers in N. America were organised as chartered companies, with royal letters patent. They remained under the supervision of the gov. at home, but developed according to their own needs. They traded almost entirely with Great Britain, to whom they sent raw materials, receiving in return manuf. products. The Brit. empire in India (see INDIAN SUBCONTINENT), which was not technically a C., having a secretary of state of its own, began through the commercial industry of the E. India Co., which

was incorporated in 1600. The new possessions which accrued to Great Britain during the 18th cent. were, chiefly, trophies of war. Gibraltar (q.v.), the gate to the Mediterranean, and as such of invaluable importance to a maritime country, was captured in 1704. Through the victories of Olive and Wolfe, before the end of the cent. Great Britain reigned supreme over India and Canada (q.v.), which did much to compensate for the loss of North America. The 19th cent. was a period of development and consolidation. Australia, first used as a dumping-ground for convicts, had grown greatly in prosperity, and its different provs. were united into an autonomous commonwealth in 1901. After the rebellion of 1837-8, responsible self-gov. was given to the C.s of Brit. N. America, the last to receive it being Brit. Columbia in 1863. In Africa, after the Transvaal War (1899-1902), the C.s in the S. were united under the name of the Union of S. Africa (q.v.), with a representative gov. of its own. Other Brit. C.s which have (or have had) self-gov. are New Zealand and Newfoundland (qq.v.). Newfoundland's administration was vested in 1934 in a Commission of Gov. under the supervisory control of the imperial gov., but in 1949 the is. joined the Canadian Confederation.

The term C. no longer applies to Australia, Canada, New Zealand, S. Africa, Ceylon, and Ghana (formerly Gold Coast), which are styled dominions (see DOMINION STATUS). The Statute of Westminster, 1931, provides that the expression 'colony' shall not, in any Act of the U.K. Parliament passed after 1931, include a dominion or any prov. or state of a dominion. The Brit. Parliament has no veto over the legislation made in the dominions or in self-governing C.s, but the Crown appoints the governor or governor-general, who is responsible to the imperial gov. A dominion gov. may make recommendations as to the appointment of a governor-general, as was done in the case of Sir Isaac Isaacs, who was made Governor-General of Australia in 1931, and, a few years later, in the case of Sir Patrick Duncan, the Governor-General of the Union of S. Africa, and his successor Maj. G. B. van Zyl. The term C.s is used loosely to describe all Brit. ters. that have now become self-governing, though strictly they comprise C.s, protectorates, protected states, and trust ters. Few are now without some popular element in the legislature, and in many elected members form almost the whole of the legislative assembly and a majority in the executive council. Some, such as Jamaica and the regions of Nigeria, are already not far from internal self-gov., which they will achieve in due course as Ghana achieved it in 1957. See COLONIAL LAW; EMIGRATION; and COMMONWEALTH and EMPIRE SETTLEMENTS ACTS. For detailed accounts of the hist. of C.s see articles on the chief colonising countries, Great Britain, Spain, etc.; see also the entries on the various dominions or C.s mentioned in this article. See also bibliographies for BRITISH

COMMONWEALTH and COLONIAL DEVELOPMENT AND WELFARE, and Lord Hailey, *An African Survey*, 1938; E. Walker, *Colonies*, 1944; P. T. Bauer and B. S. Yamey, *The Economics of Undeveloped Countries*, 1957.

Colophon, final paragraph found in some MSS. and in printed books before the introduction of title-pages, giving the name of the author, the date and place of production, and the name of the copyist or printer, pious remarks being frequently added in the case of old MSS.

Colophon, ant. Ionian city in Asia Minor, near the coast, between Lebedus and Ephesus, the bp. of the poet Mimnermus.

Colophony, **Common Resin**, or **Rosin**, exudes from certain species of pine in a semi-liquid state. This is the crude article, and consists of the resin proper and turpentine. On distillation the turpentine is obtained and the resin left behind. This is a brittle, solid, and semi-transparent substance, varying from pale yellow to dark brown in colour. It is insoluble in water, but dissolves in alcohol, chloroform, etc. It burns with a smoky flame and melts easily, decomposing if heated much, giving resin-oil as a chief product. It is used extensively in soap manuf., the sizing of paper, and as a protective in soldering.

Coloquintida, see BITTER APPLE.

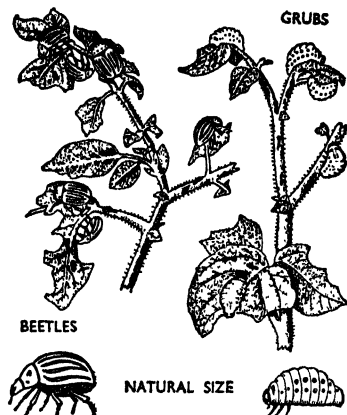
Colorado, one of the states in the Mt. Div. of the U.S.A. It is bounded on the N. by Wyoming and Nebraska, on the E. by Nebraska and Kansas, on the S. by Oklahoma and New Mexico, on the W. by Utah; its lat. is 37-41° N. and its long. 102-109° W. Its area is 103,987 sq. m., and its pop. in 1950 was 1,123,296. C. is crossed from N. to S. by ranges of the Rocky Mts, having close upon 50 peaks upwards of 14,000 ft in altitude; Elbert, the highest, is 14,431 ft, the next highest, Blanca, being 14,363 ft; and at least 300 peaks are estimated to exceed 13,000 ft. Six of the many passes which cross the ranges are at an altitude of upwards of 12,000 ft; the Argentine Pass is at a point 13,132 ft high. Railways cross many of the passes, traversing valleys and canyons in their course and presenting examples of great engineering skill. The Denver and Rio Grande W. railway crosses Marshall Pass at 10,856 ft, and in 1928 the Moffat Tunnel, 6.4 m. long, was opened under James Peak. In the central mt region are the superb parks or rich mt valleys, the canyons, and the hot springs which have often been described. The E. rivs. of the state belong to the Mississippi valley, the W. to the C. R. Of the former the most important are the S. Platte, the Arkansas, and the Rio Grande del Norte, draining the Atlantic slope; while to the latter belong the Bear and the Gunnison or Grand rivs., which drain the Pacific slope. The climate of C. is very salubrious and regular; its atmosphere is remarkably dry, rendering sojourn there most beneficial to consumptives and asthmatics. Its many medicinal (chalybeate, sulphur, and soda) and thermal springs, also contribute to make the

state a very valuable health resort. Of C.'s 66,500,000 ac. some 26,000,000 are grazing lands, while c. 20,000,000 ac. are forest land. About 3,000,000 ac. are under irrigation. The prin. irrigated crop is alfalfa; others are hay, sugar-beet, vegetables, and grain. The chief minerals are bituminous coal and petroleum, and C. is the chief U.S. producer of uranium, radium, molybdenum, and vanadium; there are also gold, silver, lead, zinc, tungsten, lithium, and feldspar. Agriculture is the prin. industry, mining and cattle raising coming next in order. Until 1910 C. was the leading state for the production of gold; then, however, it was outstripped by California. Montana, Utah, and Nevada alone surpassed it in output of silver. The locust and the C. potato-beetle have hitherto been very inimical to the labours of the agriculturist, but headway is being made against these pests. Stock-raising is mostly confined to sheep and cattle, and the export of dead meat is an important industry. Part of C. was acquired by the U.S.A. from France in 1803 and part from Mexico in 1848. In 1858 the discovery of gold brought settlements of Eng.-speaking people to the dist.; these pioneers came from Kansas, Nebraska, and Missouri. Immigration went on in a continuous stream during 1860-2, when it was checked for some years by the warlike attitude of the native Indians, to be resumed again in 1865. C. was admitted as a state in 1876. The pop. is of mixed origin, but is largely made up of immigrants from the older Amer. states; there is a small Sp.-speaking colony in the S. The chief tns are Denver, state cap., pop. 415,786; Pueblo, 90,188; C. Springs, 45,472; Boulder, 20,000.

Colorado University, of state institution for the higher education of both sexes at Boulder, Colorado, opened in 1877. It has colleges of arts and sciences, education, journalism, engineering, pharmacy, and music, a graduate school, schools of medicine, nursing, law, and business, and an institute of arctic and Alpine research. The enrolment in 1955 was 8900, and the teaching staff 715. The library had 756,000 vols.

Colorado Beetle, or **Potato Beetle**, *N. Amer.* member of the family Chrysomelidae. The chief characteristics of the beetle are the longitudinal stripes of black and yellow, i.e. stripes running from the front to the tail and *not* across the insect. The bright pink or red colour of the grubs will serve to identify them, provided they are found eating potato leaves, since there is no similar insect in the country that feeds on potato leaves. A further characteristic sign of both beetles and grubs is the black and rather messy excrement (frass) which is left on the potato leaves. The C. B. spends the winter buried deeply in the soil—10-12 in. in average soils. In late spring or early summer it works its way to the surface and flies in search of potato crops, travelling distances of sev. m. if necessary. On reaching a crop the beetles feed upon the potato leaves, and the females lay clusters

of eggs on the leaves, the majority being attached to the under-side. In a few days the eggs hatch into grubs, which also feed upon the potato leaves. After about three weeks the grubs are fully grown, and descend into the soil, where they turn into pupae. Ten to fifteen days later they undergo a further and final change into adult beetles. Towards the end of July and during Aug. these beetles come up to the surface, feed, and, if the weather is warm, lay eggs that produce a further generation of beetles before the haulm dies off in the autumn. With the end of summer the beetles burrow down into the



Text and illustration reproduced from Ministry of Agriculture and Fisheries' advisory leaflet by permission of the controller of Her Majesty's Stationery Office.

COLORADO BEETLE AND GRUB

soil again, and stay there for the winter. The effect upon the potato crop depends upon the number of beetles and grubs present. When there are many the haulm is completely stripped of leaves, and no tubers worth digging are formed. It is by the destruction of the haulm that the pests do damage; they do not burrow into the tubers themselves. The C. B. is notable for its ability to adapt itself to different climatic conditions, and for the way in which it can spread rapidly, both by flight and by making use of trains, boats, or other forms of transport. These two characteristics explain how it is that an insect formerly restricted to a semi-desert region of the W. U.S.A. has already occupied most of the N. Amer. continent, and has now colonised many European countries, including France, Belgium, Holland, Germany, and Switzerland. Since 1933 there have been a number of outbreaks in England, but by the exercise of drastic measures the pest has so far been prevented from establishing itself. The kinds of insect most frequently

confused with the C. B. are the useful ladybird beetles (marked with black spots on an orange or red ground colour), and their grubs and pupae; the burying or sexton beetles (much larger than the C. B., and marked on the back with orange-red and black bands from side to side); and the cockchafer (q.v.) (yellowish-buff in colour).

Colorado Desert, immense desert in the S. of California, U.S.A., situated to the W. of the Colorado R. It contains the Coachella Valley, the lowest part of which once formed the San Felipe Sink, about 300 ft below the level of the sea. In 1891 the flooding of the Colorado R. formed a lake of 8000 sq. m. in the Coachella Valley. This to some extent dried up afterwards.

Colorado River: 1. Large and remarkable riv. of SW. U.S.A. It rises in the Continental Divide in the NW. corner of Rocky Mt National Park, Grand co., Colorado. It receives Dolores R. and Gunnison R. in Colorado, Green R. and San Juan R. in Utah, Little Colorado and Gila R. in Arizona. From a generally southerly direction the riv. turns due W. to cut through the mt ranges, then again due S., entering the gulf of California after a course of about 1400 m. The C. R. is unique in the world by reason of the wonderful channel it has carved out for itself. It flows for miles at a time at the bottom of a deep trench, or canyon, which it has cut out through stratum upon stratum of rock. The walls of these canyons are often from 4000 to 7000 ft high, sometimes rising sheer from the stream; sometimes there has been a fall of rock which breaks up the perpendicularity, and which now and then gives rise to a strip of fertile ground. The most remarkable of these ravines is the Grand Canyon (q.v.), the most extensive not only of the Colorado canyons but of any in the world. This occurs after the junction of the Colorado Chiquito with the main stream. The riv. makes its way for about 200 m. through a great plateau, and the Grand Canyon is the result. Further down is the Black Canyon, whose height is about 1000-1500 ft, and whose length is 25 m. In this dist. are to be found numbers of abandoned prehistoric dwellings, some on cliffs in the canyons, others on high ridges. This seems to indicate that at some distant time it was more adapted for the support of human life than it is now. Navigation of the C. R. is possible only for about 600 m. The riv. is used extensively for irrigation and power. The Colorado-Big Thompson project provides for diversion of water from the riv. on the W. slope of the Continental Divide, through Alva B. Adams Tunnel to Big Thompson R. on the E. slope, where dams divert water for the irrigation of 615,000 ac. in the basin of South Platte R., in NE. Colorado. There are hydro-electric plants at Olympus Dam on Big Thompson R. and at Green Mountain Dam on Blue R. Hoover (Boulder) Dam, between Nevada and Arizona, is the chief unit in a programme of flood control, power, and irrigation for the basin of the lower Colorado R. Other units are Parker Dam and Davis Dam, N. of Yuma.

The Imperial Dam diverts water into the All-American Canal for irrigation of the Imperial Valley.

2. Texas, U.S.A.; rises in the tablelands in the NW. by many heads, the chief being N. Fork and Salt Fork; flows SE. for about 715 m., entering the bay of Matagorda just SW. of Matagorda. Chief towns on its banks: Austin (state cap., at the head of steamboat navigation), Bastrop, and La Grange.

Colorado Springs, cap. of El Paso co., Colorado, U.S.A., 65 m. SE. of Denver. It is a favourite summer and health resort, standing in lovely scenery at an altitude of 6000 ft, and sheltered by mts on the N. and NW. It produces film, wood, granite, concrete, and dairy products, vaccines, chemicals, motor trucks, and mechanical appliances. Gold reining and meat packing are also important industries. Ent Air Force Base is H.Q. of Air Defence Command. Pop. 45,472.

Colono, lt. tn, in Emilia-Romagna (q.v.), on the R. Parma, 10 m. N. of Parma (q.v.). It has a fine palace of the Farnese (q.v.) family. Pop. 2500.

Colosseum, name of a celebrated amphitheatre in Rome (see next page), one of the most important monuments of Rom. antiquity. It was begun by Vespasian, finished in AD 80 by Titus (qq.v.), and was known originally as the Flavian amphitheatre, Flavius being the family name of these two emperors. The name C. was first employed by Bede (q.v.) in the 8th cent., in reference, no doubt, to its colossal size; it was the colossal building *par excellence*. The C. was used for combats of gladiators and wild beasts; after the shows the arena was often filled with water and used for nautical displays. It is now in ruins—a gigantic stone carcass. Sev. times ravaged by fire and always restored, it served the barbaric pleasures of the Romans until the end of the 6th cent. Since then it has suffered pillage at the hands of the barbarians, has been used as a fortress by brigands of noble Rom. families, has been transformed into a huge quarry, marble for the forum being calcined there in lime-kilns, and its own stones have been carried away for building purposes. Pope Benedict VIII saved it from further devastation by consecrating it to the memory of the Christian martyrs and by erecting crosses and oratories within its walls. Popes Pius VII, Leo XII, and Pius VIII further preserved it by buttressing the walls, etc. In form the C. is an ellipse whose axes measure 615 ft and 510 ft; its height is 160 ft to 180 ft, and the arena about 281 ft by 177 ft. It is estimated to have held seats for 87,000 persons and standing room for 20,000 more.

Colossians, Epistle to the. Colossae was a town of NW. Phrygia, in the valley of the Lycus. This epistle, one of the four captivity letters, was written by St Paul in Rome about AD 62, on the occasion of the springing up in the church at Colossae of a Judaeo-Gnostic heresy. The chief features of this heresy were the worship of angelic mediators and asceticism. The Colossian church was mainly Gentile, and this doctrine was taught by converts from

Judaism, who tried to impose its ceremonial observances upon their Gentile brethren. Epaphras, the founder of the church at Colossae, informed St Paul of this, and the Apostle wrote to combat this invading 'philosophy' and earnestly contend for the supreme dignity of Christ. The epistle contains a remarkable statement of the cosmic significance of Christ, pre-existent, divine, and the goal of all creation. The epistle was dispatched by the hands of Tychicus, who carried the Epistle to the Ephesians at the same time. The latter, being a circular letter to other

easily digested and is essential for early health.

Colotomy, that operation which involves opening into the colon.

Colour, sensation excited by the action of rays of light on the retina of the eye. Light consists of electro-magnetic waves, and its properties depend upon the wave-length of the waves. Of the whole group of radiations of the same nature, ranging from long wireless waves on the one hand to X-rays and gamma-rays on the other, the eye is sensitive to only a narrow band of wave-lengths. In this band the longest



Anderson

THE COLOSSEUM, ROME

churches besides Ephesus, is probably that described in iv. 16 as coming from Laodicea to Colossae. See L. B. Radford, 1931; also commentaries by J. B. Lightfoot, 1876; T. K. Abbott, 1897.

Colossus, word originally used by the Greeks, and afterwards adopted by the Romans, to designate statues that were more than life size, and particularly those of gigantic proportions. The name was especially used to signify the celebrated enormous statue known as C. of Rhodes, (see APOLLO OF RHODES). Other famous colossi of the ancient world were the statue of Athena in the Parthenon (by Phedias) and that of Nero in his Golden House.

Colostrum, or **Beastings**, is the first milk taken from a cow or other animal following parturition. It is usually rather yellow and thicker than ordinary milk and contains more protein. The extra protein is in the form of globulin which is very

waves excite the sensation of red and the shortest that of violet. Ordinary white light from the sun or from an incandescent solid or liquid can be resolved into its components (by a prism, for example) to form a spectrum in which the radiations of each particular wave-length are concentrated at one point. In this way it is shown that the radiation that excites in the eye the sensation of white consists of a mixture of radiations which separately produce sensations of C. Seven different C.s (red, orange, yellow, green, blue, indigo, and violet) are conventionally distinguished in the spectrum, but as each shades off gradually into its neighbours there is no sharp demarcation between them, and most observers find difficulty in accepting all these C.s as distinct, preferring to regard the blue, indigo, and violet, for example, as shades rather than as separate C.s. Certain C.s such as brown

and purple are not found in the spectrum, and are not induced as sensations when light of any one wave-length falls on the eye.

Although ordinary white light consists of a mixture of all the spectral C.s, the sensation of white can also be produced by other mixtures such as that of blue and yellow lights of appropriate intensities, or by red, blue, and green. This fact may be used in the production of white light by electric discharge lamps, the light from which appears to the eye to be indistinguishable from ordinary white light, although the intensities of the various C.s present are not necessarily the same in the two cases. In the same way lights of such wave-lengths as separately produce the sensations of pure spectral C.s may give, when mixed, a sensation indistinguishable from that of another spectrum C., or of a C. not found in the spectrum. A mixture of green and red lights, for example, produces the sensation of yellow. The C.s of non-luminescent objects therefore depend upon the nature of the light falling on them, upon their action on this light, and upon the reaction of the eye to the light transmitted to it from the objects. With few exceptions the action of a coloured object upon the light falling on it is merely one of subtraction of one or more spectral C.s. Thus when white light falls on a red glass the glass appears red when viewed by transmitted light, because the light passing through it has the wave-lengths associated with the sensation of red. This light may be either radiation of a narrow band of wave-lengths at the red end of the spectrum, or a wider band in which red is the predominant C., because the red light is of a higher intensity than the orange and yellow. Similarly a blue glass appears blue because it absorbs all the rays except those at the blue end of the spectrum, while if the red and blue glasses are superimposed any radiation transmitted by the one is absorbed by the other, with the result that the combination looks black. Opaque objects act in a similar way. The light reflected to the eye penetrates the surface of the object for a short distance while undergoing reflection, and in doing so some of its C.s may be absorbed. If there is no preferential absorption the object appears white when viewed in white light, and when viewed in coloured light appears to be the C. of the light. A blue object on the other hand appears blue in white light because it absorbs light of the red end of the spectrum, and reflects only that from the blue end. If viewed in blue light the light is reflected and the object still appears blue, but if only yellow light falls on it none is reflected, and it appears black. Most blue objects, however, reflect appreciable amounts of green light as well as blue, and therefore appear green in a pure green light. When two pigments are mixed both may continue to absorb the same C.s as before. Thus when white light falls on a mixture of blue and yellow pigments the blue particles absorb all but the blue and green light,

and the yellow all but the orange, yellow, and green. The only light not absorbed by either is therefore green, so this is the C. seen by the eye. It is very important to distinguish carefully between the effects produced by the mixing of coloured lights and of pigments.

C. has three varying properties: it may be said to possess *hue*, *purity*, and *luminosity*. Its hue or tint gives it its name, as, for example, ultramarine and indigo blues. The purity or richness of a C. is determined by the amount of white light which is diluting the tint, and according to its purity we talk of the paleness or deepness of a given C. Again, the luminosity determines the shade of a C. and gives it its quality of darkness or brightness. Various theories as to the mode of C. perception have been put forward, but all meet with difficulties. Young (1807) and Helmholtz (1853) believed that the retina contains three kinds of colour sensitive cells. Each of these is excited by only one C., and it is supposed that there are three physiologically primary C.s. Opinions differ as to what these C.s are, but we may take them as being red, green, and violet. According to this theory, if the cells sensitive to all three C.s be simultaneously excited, according to the proportion of excitation of each set of cells then the resultant impression may be either a simple C. or white. Similarly, simultaneous excitation of the cells sensitive to green and violet would result in some C. in the spectrum, ranging between green and violet, according to the proportion of the excitation of the two cells. This theory will account for the appearance of consecutive coloured images. For example, if a red object be viewed for a long while, the eye becomes fatigued to red, and in darkness an image composed of green and violet will result in an after image of a pale greenish-blue hue. Viewing an object in white light with the eye fatigued to red, then, causes one to see an intense complementary image coloured by a blend of green and violet. See also INTERFERENCE; LIGHT; SPECTRUM; VISION, DEFECTS OF. See A. H. Church, *Colour*, 1901; W. de W. Abney, *Researches in Colour-vision*, 1913; E. R. Watson, *Colour in Relation to Chemical Constitution*, 1918; W. H. Bragg, *Universe of Light*, 1933.

Colour, in Art. Primary C.s are red, yellow, and blue in practice, in contrast to the red, orange, yellow, green, blue, indigo, and violet in pure physics. Secondary C.s are produced by a mixture of pigments, representing the primaries. These are orange (a mixture of red and yellow), green (blue and yellow), and violet or purple (red and blue). Tertiary C.s are produced by a mixture of two or more of the secondaries; generally dark and tending to greys or browns, they are in practice lightened or darkened by the addition of white or black pigment. See also PIGMENT.

Colour Bar (see also APARTHEID), discriminatory legislation or regulations, or a spontaneous prejudice and sentiment, against coloured races. It is of great

antiquity, and, in its wider implications, is a corollary of slavery. The white man's more efficient technical equipment and more advanced intellectual achievements tended to make him contemptuous of native, and especially African native, manners and customs and culture generally. This attitude of 'superiority' does not, however, explain the discrimination, which is motivated by the white man's determination to retain his privileged position. In this article the phrase C. B. will be used in the technical sense of formal discriminatory legislation rather than in the sense of discrimination social, religious, economic, and educational, both official and unofficial, which sometimes characterises the general relationship between the white man and the coloured.

Discriminatory or differential laws and regulations are mainly found in Africa—in the Union of S. Africa, S. Rhodesia, and to a limited extent in the Brit. dependencies in E. Africa—and in the S. states of the U.S.A. In the Brit. W. Indies or other parts of the world under Brit. dominion the C. B. is almost non-existent. To a much smaller extent W. Africa, not being suitable for white settlement, also is markedly free from colour restrictions, especially as there exists a large independent pop. of peasant proprietors. C. B. may be said to be non-existent in the Fr., Portuguese African, and other dependencies; but this would not be true of the Dutch colonies, especially the Dutch E. Indies, where before the Second World War there was a strong Nationalist movement founded largely on the disparity, social and economic, between the Dutch or other Europeans there and the natives. In the Asiatic dependencies of other European powers the C. B. question does not arise, though in S. Africa and Kenya there are discriminatory laws against the large Indian immigrant pop. in those two ters. The C. B. legislation in the Union of S. Africa, begun in 1912, had an important psychological effect, as it seemed to justify all the unwritten C. B.s which had developed in the previous century or more in that country. A process was begun which soon excluded natives from working on the railways and in other forms of gov. employment, and led finally to the abolition of the Cape native franchise which began in Cape Colony in 1853 and ended in 1936 with the passing of the Native Franchise Bill. The removal of the Cape Coloured from the electoral roll in the Cape Prov. of S. Africa followed the passing of the Separate Representation of Voters Act Amendment in 1956, which brought into force the Separate Representation of Voters Act of 1951.

The C. B. in S. Africa had its foundation in the clause of the original constitution of the Transvaal: 'There shall be no equality between black and white, either in Church or State,' the very antithesis of the political ideal implicit in Cecil Rhodes's phrase: 'Equal rights for all civilised men south of the Zambesi.' In 1912 a political philosophy, based on the segregation of natives and Europeans, was put forward by the S. African Labour

party, a policy which assured the permanent maintenance of the white community in a position of political and economic supremacy, and the preservation of the standards of European civilisation by reducing the contacts of the 2 races to the minimum which the economic system necessitated. Gen. Hertzog (q.v.) came into office on this programme in 1924, and developed it to the full. But this C. B. policy only works effectively where there are big industries or mines, especially where white labour is organised. The number of natives residing in urb. areas is rigorously controlled and their locations kept separate from the European residential areas. It is at the same time assumed in S. Africa, as in S. Rhodesia, which has adopted the same principles, that within the sphere of the native reserves the professions and skilled trades shall be fully open to Africans. Union policy has not only strongly influenced S. Rhodesia, but also to some extent determined the attitude of European settlers in the highlands of Kenya. Most of the Brit. ters. in tropical Africa, however, are climatically unsuitable for white settlement and their development has been characterised by a different philosophy. But local opinion in Kenya has favoured the S. African segregation policy, while public opinion in Britain has taken the view that native interests deserve more explicit consideration. In Fr. colonial ters., C. B. does not exist, for economically the aim of the Fr. is that the mother country and the colonies should form a unit—a centralising attitude bound up with the 'assimilationist' theories which had their origin in the egalitarian doctrines of the Fr. Revolution and which remain the foundation of Fr. colonial philosophy.

Although in S. Africa the operation of the legal C. B. is confined to the mines, the trade union system applies in practice a C. B. discrimination in most of the skilled trades. The state, moreover, supports this, the so-called civilised labour policy, by legislation designed to prevent natives from entering the higher grades of skilled employment. But the policy of the S. African gov. is to encourage natives, within their demarcated areas, to become skilled artisans and to practise professions. The Mines and Works Amendment Act, 1926, is the most conspicuous C. B. measure, and the one that is generally known as the C. B. law. It authorises the gov. to make regulations providing that certificates of competency in certain occupations shall be granted only to Europeans and certain classes of coloured persons; in practice the regulations apply to the grant of certificates of competency for certain operations in mining. The 'civilised labour' policy exists in principle in S. Rhodesia, but in the absence of any large 'poor white' community, and of large industrial organisations, it is less in evidence than in the Union; but there is none the less a considerable body of differential legislation, particularly in relation to land apportionment, trade unions, marketing

systems, and the regulation of the movements of natives by the 'pass' system. The pass laws appear in their most conspicuous form in S. Africa—there are trek passes to enable a native to leave his reserve, an identification pass to satisfy the police, a travelling pass to buy a ticket, a monthly pass serving as a contract of service, a daily labourer's pass, and sev. other kinds. These passes were originally in the nature of police regulations, but were later utilised to assist in securing a supply of labour, and to prevent desertion; and, in their latest stage, while still used to safeguard the labour contract, they have become part of the machinery of the segregation policy, being instrumental in restricting the influx of a native pop. into urb. areas. The pass system also exists in S. Rhodesia and Kenya, but in both cases the regulations are simpler and less exacting. In Kenya the use of pass laws originally arose from the need to check wandering tribesmen and stock thieves, and it was only later that they were used to meet labour difficulties. Despite the C. B. tendencies in imitation of S. Africa, there is no actual C. B. legislation in S. Rhodesia; but the Industrial Council Act and the strength of organised labour in transport and skilled occupations there have been able to prevent the rise of any large class of native skilled workers occupied in the European economic system. Kenya does not show the same conflict of interests between the European and African as in the industrial development of the Union of S. Africa. Such conflict with European interests as does exist has arisen from the position claimed by Asiatics in the political field and in regard to land settlement; and in the industrial sphere the settler community has supported the tendency of Africans to replace Asiatic skilled labour. These considerations largely explain the nature of the differential laws applicable to natives in Kenya; they deal primarily with the place of the native in the European farming areas and have only in a small degree been motivated by apprehensions of the result of contact in the industrial and social fields.

Whether there is any biological justification for the assumption of coloured inferiority in intellectual capacity to the white man, or real biological foundation for the concept of 'race,' may be studied in A. C. Haddon, *The Races of Man*, 1929; J. Huxley and A. C. Haddon, *We Europeans*, 1935; Ruth Benedict, *Race and Racism*, 1942.

Unlike the old Transvaal Constitution (quoted above) the Amer. Declaration of Independence, 1776, proclaimed as a self-evident truth the fact that all men were created equal and endowed by their Creator with certain inalienable rights, including 'liberty.' But evidently the framers of this constitution regarded Negroes as property and therefore incapable of having rights. After the Civil war the whites of the S. feared that if the Negroes had the vote they might outnumber them; hence it was decided

that only those who paid a certain sum in taxes could vote, and this is still the law in most of the states where there are large numbers of Negroes—a law which is essentially discriminatory in view of the poverty of the Negro. But while in the S. the Negroes are made to keep apart from the whites in all public places such as railway stations or public conveyances, and in the N. contact is reduced to a minimum, there exists no C. B. legislation.

The foregoing observations take account of the C. B. simply as a problem of social adjustment. The Christian view, however, is that of a moral problem, and the great majority of Christian Churches are strongly opposed to the C. B. Rom. Catholic theology is explicit on this point: race prejudice, discrimination, and compulsory racial segregation are sinful. The assertion rests upon 2 fundamental principles, as follows: (1) Since all men have been created by God, and are consequently sons of the same Eternal Father, they all possess the same fundamental human dignity and rights. (2) The redemptive mission of Christ was fulfilled on behalf of all men, who therefore enjoy the same supernatural dignity and rights as members of His Mystical Body.

See W. M. Macmillan, *Warning from the West Indies*, 1936, and *Africa Emergent*, 1938; Lord Hailey, *An African Survey*, 1938 (the most reliable authority); D. Westermann, *The African To-day and To-morrow*, 1939; J. Cary, *The Case for African Freedom*, 1941; M. Perham, *Africans and British Rule*, 1941; S. Van der Horst, *Native Labour in South Africa*, 1942; E. H. Brookes, *The Colour Problems of South Africa*, 1943; E. Huxley and M. Perham, *Race and Politics in Kenya*, 1944; H. Kuper, *The Uniform of Colour*, 1947; G. H. Calpin, *Indians in South Africa*, 1949; E. Hellman and L. Abrahams (ed.), *Handbook of Race Relations*, 1949; Sheila Patterson, *Colour and Culture*, 1952; T. J. Haarhoff, *Race Problems in South Africa*, 1952; J. Lafarge, S. J., *The Catholic Viewpoint on Race Relations*, 1956; T. Huddleston, C. R., *Naught for Your Comfort*, 1956; and A. Steward, *You are Wrong, Father Huddleston*, 1956.

Colour-blindness (Achromatopsia), affection of the eyes which renders them unable to distinguish certain colours or shades of colour; in an extreme form, which is very rare, everything appears grey. C. is nearly always congenital. More common to the male than the female sex, it is transmitted through the female to male children. About 10 per cent of the male population have some defect of colour vision. The colour-blind woman is rare. The most common form of defect consists in difficulty in distinguishing differences between red, green, and yellow. People with this defect are sometimes called red-green blind. They can see the colours but have difficulty in distinguishing which is which. There is also a defect in which blue, green, and yellow are confused. Often boys with defective colour-vision grow up unaware of their disability, and since 1953 many education authorities test schoolchildren for colour vision.

It is wise for the test to be repeated between the ages of 16 and 20, as the condition may have deteriorated by then. The cause of colour-blindness is in some cases a defect in the function of the rods or cones of the retina (*see under EYE*), and in others the defect lies in the nerve cells of the visual centre in the brain. There are various test-cards used in the Mercantile Marine service and for railways, which show the colours of the spectrum, and candidates for appointment are required to pick out the various colours as they are named. Holmgren's test consists of matching and naming five finely matched shades of each of twelve different coloured wools, which are handed over, well mixed up, to the examinee. This has now been abandoned. The distinguishing feature of the Jap. Ishihara tests (10th ed. 1953; H. K. Lewis, London) is the application of the peculiarity of red-green C. which sees blue and yellow more brightly than red and green. The test plates consist of groups of tiny circles in varying colours and intensities of the same colours. Some of these form a numeral which may be read off correctly or incorrectly as it is seen by the person being tested. A coloured lantern test is also in use. *See also HEREDITY, Types of Inheritance.* See W. D. Wright, *Researches on Normal and Defective Colour Vision*, 1946.

Colour Photography, *see* PHOTOGRAPHY.

Colour Printing is of three styles: relief, intaglio, and lithography. Relief is the oldest style, and includes printing from wood blocks, photo-engraved surfaces, and stereotype and electrotrope plates. Intaglio work began in the 15th cent., and includes engraving on copper or steel, etching, mezzotint process, and photo-gravure. Printing in colour may have been practised even before the time of John Gutenberg of Mainz, the reputed inventor of printing, and some authorities think that the Romans used a process of copying by engraving on ivory and then making tinted reproductions on canvas by means of plates. Even if this is mere speculation, as indeed is the assumption that C. P. was known in the Far E. before the 18th cent., there is extant a 5th-cent. work, the 'Gospels of Ulphilas,' now in the Univ. Library, Upsala, the text of which is in gold and silver on vellum of a mauve hue. There are also in the Victoria and Albert Museum some examples of fabrics whose patterns would appear to have been made from wood blocks in the 11th cent.; and again, in the 15th cent. a Venetian decree was issued for the protection of the local industry of making coloured playing-cards and pictures of saints. But according to the leading authorities, notably R. M. Burch, C. P. had its origin in attempts to imitate by mechanical means the colour decoration of the MSS. which furnished the text for the earliest printed books (*see* ILLUMINATION of MANUSCRIPTS). It is doubtful whether, in the earlier period of C. P., any separate pictures in colours, as distinct from rubricated typography and other coloured type, were produced, one difficulty, however, being to distinguish, in the extant

MSS., where the printer's work ends and hand-work begins. The chief printers in colour at this period were those of Venice, London, Mainz, Paris, and St Albans. The 16th cent., however, saw the rise of the art of printing pictures in colours by the method which is known to this day as *chiaroscuro* (q.v.), the aim being the rendering of various tones of one colour. Among the earliest printers in *chiaroscuro* were Ugo da Carpi, who is believed by older writers to have been the inventor of the process, and Jost de Necker, an Antwerpian, believed by Bartsch to have invented the process; but there are other names anterior in date to these, including Mair of Landshut, a Ger. artist, and Francisco Dentato, a Venetian, who printed in a dark brown colour; and it was also practised by many of the great masters of engraving, painting, and drawing who were contemporary with the inventor of the process, whoever he was. These included Burgkmair, Cranach, Dürer, many of whose drawings, engravings, and woodcuts suggest *chiaroscuro* work. Colours in *chiaroscuro* printing were evidently applied by the press at this time, hand-colouring or stencilling being a later process used to supplement the press colouring and chiefly for colouring playing-cards, though to some extent it was used in the 16th, 17th, and 18th cents. for book illustrations. The art of producing prints in the original *chiaroscuro* style appears to have died out with John Skippe, of Ledbury, about whom little is known beyond the fact that he was educ. at Morton College, Oxford. Skippe, who lived in the 18th cent., used three- or four-tone blocks, generally browns, ochres, or olive greens in varying shades. With the 18th cent. comes the rise of intaglio-printing processes. Mezzotint engraving was invented by Ludwig von Siegen (1609-c. 1675), an officer in the service of William VI, landgrave of Hesse, in the 17th cent.; but the printing of mezzotinted plates is a late 18th-cent. art, and, together with it, two other processes—stipple engraving and aquatinting—were invented. All these are 'grain' processes, i.e. the grain is formed by a series of dots so arranged as to conform to the planes and modelling of the subject (*see under* ENGRAVING). The first engraver to practise stipple work was Johann Lutma, a 17th-cent. Ger. silversmith, sev. of whose plates are extant. Notable Fr. engravers in stipple were Jean François, of Nancy (b. 1717), Louis Bonnet (b. 1743), and Gilles Demarteau (b. 1722), the last two being engravers in the crayon style. Bonnet printed in colour from sev. plates to imitate pastel. The first Eng. stipple engraver was Wm Wynne Ryland (1732-83), who, after completing his training in Paris, became engraver to King George III. Improvements on the process were made by a London engraver, Robert Laurie (c. 1755-1836), who invented a method of producing copperplate pictures in colours at one impression, by inking the plate with stump brushes—a combination of mezzotint and stipple designed to produce book

illustrations at a low cost. Aquatint, the latest of the intaglio engraving processes not dependent on photography, is really tone etching, the graving being effected by the use of acid, so that there need be no lines. The authorities ascribe the invention to Jean Baptiste le Prince, a Fr. painter and engraver, who d. in 1781, and give the date of the first adaptation of the aquatint method to C. P. as about 1768. In England the earliest exponent was Paul Sandby (1725-1809), whose work was in monochrome only. Other notable names in the art of aquatinting are P. L. Debucourt, court painter to Louis XVI, whose 'Promenade in the Gallery of the Palais Royal' is famous; J. F. Janinet (b. 1752), a fine draughtsman and designer; and J. T. Prestel (b. 1739), a Ger. artist. Some of the most familiar 18th-cent. Eng. prints in colour are Wheatley's 'Cries of London,' of which modern copies are still produced. Jap. colour prints, made from wood blocks, were well advanced by the early 18th cent., the greatest of the earlier exponents being S. Harunobu, who was imitated by Utamaro, the latter's prints initiating the European vogue of Jap. prints and their influence on colour in European painting. Hokusai (1760-1849) was the most famous of all Jap. colour-prints artists, his best-known series being the 'Thirty-six Views of Mount Fuji' (see JAPAN, Art). In the 19th cent. there was a notable revival of the old chiaroscuro process in a new form known as chromo-xylography, and the most famous name in this connection is that of George Baxter (1804-67), the son of a Lewes typographer, whose process, really only printing in oil colours from wood blocks, consisted in colouring an impression from an outline or key block, which was either a copper or steel plate or a litho stone, by successive impressions from colour blocks of wood or metal. He certainly achieved his object, which was to produce ornamental prints in colours which resembled highly coloured painting in water colour or oils, and for some time he held the field alone. Later names in chromo-xylography were those of Charles Knight (1791-1873), the pioneer of cheap illustrated magazine literature, whose coloured plates for *Old England Worthies* (1847) were well known; George C. Leighton (b. 1826), the printer-publisher of the *Illustrated London News*, in 1884; Henry Vizetelly (1820-94), who engraved pictorial subjects for popular books; Edmund Evans (b. 1826), the best known of all the wood engravers for colour work except Baxter; his coloured line engravings, e.g. those after pictures by Walter Crane, Randolph Caldecott, and Kate Greenaway, are remarkable for faintness, and he will always be remembered as the pioneer in the production of cheap colour-illustrated children's books; Benjamin Fawcett (b. 1808), whose coloured prints in the illustration of the books he pub. on Brit. birds, moths, and butterflies exemplify his process of fine printing in colours; and the Knöfler brothers (b. 1859 and 1861) of Vienna,

whose beautiful colour prints soon became familiar in the windows of London art dealers. The 19th cent. also witnessed the introduction of an entirely new colour-printing method, chromo-lithography (for the principle see under LITHOGRAPHY). The application of the principle of lithography to C. P. consists, as in chromo-xylography, in first preparing the design, and determining the number of tints in which it is to be reproduced, and then drawing on a litho stone that portion which is to be in a particular colour, and so on with each of the other colours, the print being made up by the successive impressions from all the colour stones. This process is considered to begin with the issue of the *Pacis Monumentum*, a record of the facts of the peace of 1815, by J. A. Barth, of Breslau, produced in 1816. Other notable names in the earlier period of chromo-lithography are those of Engelmann, Hüllmandel, Owen Jones, Michael Hanhart, and Wm Day. The later stage in chromo-lithography dates from the middle of the 19th cent., when lithographic printing machinery was introduced. After this comes the adaptation of photography to chromo-lithography, said to have been suggested by Mr Burnett, a member of the Edinburgh Photographic Society, in 1857—called photo-chromo-lithography, and later perfected under the name of photochromy. A 'photochrom' is a colour photograph, the base of which is generally a collotype print, produced direct from the film or through the medium of a transfer on to stone. Modern Fr. chromo-lithographs are among the best examples of this process, especially those of Pierre Vidal. The artist-lithographer producing his own colour effects from stone or plate is well represented by Toulouse-Lautrec (q.v.), and there has been a modern revival of this 'auto-lithography' for posters and book illustration. Modern colour processes in printing are developments of processes for making photography the means of reproducing natural colours as far as this is possible, and the 20th cent. saw many improvements in working the three- and four-colour half-tone process. Photogravure, a mechanical intaglio process which superseded the hand-engraved copper plate, is now widely used for colour reproductions, especially in popular journals. See also COLLOTYPE; ENGRAVING; LITHOGRAPHY; PHOTOGRAVURE; PRINTING; PROCESS WORK. See W. Gamble, *Line Photo-Engraving*, 1909, and *Photography and its Applications*, 1920; V. Preissig, *Zur Technik der farbigen Radierung u. des Farben-Kupferstichs*, 1909; R. M. Burch, *Colour Printing and Colour Printers*, 1910; L. C. Martin, *Colour and Methods of Colour Reproduction*, 1923; E. J. Wall, *The History of Three-Colour Photography*, 1925; H. Curwen, *Processes of Graphic Reproduction*, 1934; T. Griffiths, *Colour Printing*, 1949. Colour-sergeant, the highest non-commissioned rank in the Brit. army (i.e. that immediately below warrant officer). It was introduced in 1813. Since 1913 the holders of the rank have always been

designated by the appointments they hold (e.g. company sergeant major) and it is usually incorrectly assumed that the rank no longer exists.

Colours, Fast, see DYE.

Colours, Military, flags and standards borne by most infantry regiments and battalions, and sometimes also by other troops. From the very earliest times banners or similar devices have been used by fighting bodies both on land and sea to act as a rallying-point and a signal. From the very fact of this practical value as a rallying-point, the banner or standard began to exercise a moral influence. This is already seen in fully developed form in the days of the Rom. Empire, when the loss of the eagle was the greatest disgrace a legion could sustain. Similarly, the flags of later times became, as it were, an embodiment of the spirit of the regiment, the link binding the soldiers of the time with the veterans of the past. The loss of the standard was the break-up of the regiment. The colours, then, were invariably taken into battle until the last quarter of the 19th cent., but now the systems of modern warfare have led to the colours being left at home by Brit. regiments. According to the present arrangement, dating from the time of Queen Anne, each Brit. regiment or battalion has two colours, the queen's colour and the regimental colour. The former is a Union flag, except in the case of foot guards. The regimental colour is a flag of the same colour as the facings of the regiment, with the name and titles of the regiment, together with the names of its pre-World War I battle honours, blazoned thereon. (Later battle honours appear on the queen's colour.) Both colours measure 3 ft 9 in. by 3 ft, the staff being about 8 ft 6 in. Rifle regiments, engineers, artillery, and the departmental corps do not carry colours. With cavalry (and armoured) regiments colours take the form of standards and guidons. Household Cavalry and Dragoon Guard regiments bear standards. Dragoons and now also Hussars and Lancers bear guidons. See T. J. Edwards, *Standards, Guidons, and Colours of the Commonwealth Forces*, 1953.

Colours of Animals, see ANIMALS, COLOURS OF.

Colt, Samuel (1814-62), Amer. inventor, b. Hartford, Connecticut; went to sea, and later lectured on chem. In 1835 he obtained his first patent for a six-barrelled rotating breech revolver, and founded the Patent Arms Company at Paterson, New Jersey, for the manu. of these weapons. In 1852 he built the enormous works of the Colt's Patent Fire-Arms Manufacturing Company at Hartford.

Coltsfoot, popular name of *Tussilago farfara*, a herb of the family Compositae, growing wild in Britain. Its leaves are heart-shaped and denticulate. Stems bear a head of bright yellow flowers. The leaves form the basis of herb tobacco used as a remedy for asthma.

Coluber, genus of ophidian reptiles (snakes). The fifty-odd species are all

non-poisonous, and occur in Europe, Asia, and America. The eye is large, the pupil round, the scales are either smooth or keeled. The species attain a great length and are oviparous. *C. quatuorlineatus*, a native of S. Europe and the Tirol, is up to 8 ft long; *C. longissimus*, the Aesculap snake, of S. and S.E. Europe, attains a maximum of 5 ft; *C. leopardinus* is a beautiful snake found in Europe and Asia Minor.

Colum, Padraic (1881-), poet, b. Longford, Ireland. Educ. at local schools, he removed to Dublin, where he joined the Irish Renaissance group of writers which included Yeats, Synge, AE, and Lady Gregory. His second play, *The Land*, 1905, was the Irish Theatre's first success; others were *The Fiddler's House*, 1907, and *Thomas Muskerry*, 1910. With James Stephens and Thomas MacDonagh he founded the *Irish Review*, of which he was editor 1912-13. In 1914 he visited America and eventually settled in Connecticut. His vols. of verse include *Wild Earth*, 1907, and *The Story of Lowry Maen*, 1937. He also wrote a large number of books for children, and ed. *An Anthology of Irish Verse*, 1948, and *A Treasury of Irish Folklore*, 1955. In 1953 he was awarded the Gregory Medal of the Irish Academy of Letters.

Columba, Saint (521-97), known also as Columkille and Colm, is said to have been b. at Garton, co. Donegal. He early learned the principles of asceticism under St Finnian of Clonard, and embraced the monastic life at Glasnevin; ordained priest in 546. About four years later he founded the monastery of Durrow; he also founded many smaller ones in Ireland. In 563 he set out with twelve followers for the little is. of Hy or Iona, off the W. coast of Mull, Argyll, and founded a monastery there. He then settled down to the work of his life, the conversion of the Picts, Scots, and N. Eng. Through his teaching, example, and miracles the work progressed favourably, and C. estab. monasteries in several parts, all subject to Iona and a rule which he himself compiled. His biographer, St Adamnan (q.v.), tells us that he could not bear to remain idle a moment, and the aggressiveness of some of his acts may be put down to this same cause. According to tradition as recorded in the Annals of Clonmacnoise he wrote some 300 books with his own hand, though there is scant authority for the identification of any. His life was austere in the extreme, yet everywhere his cheerfulness and virtue predisposed men in his favour. His feast is on 9 June. See W. P. Montalembert, *St Columba*, 1868; W. P. Skene, *Celtic Scotland*, 1877; Adamnan, *Vita Sancti Columbae*, ed. J. T. Fowler, 1894; W. D. Simpson, *The Historical St Columba*, 1927; Lucy Menzies, *St Columba of Iona*, 1935.

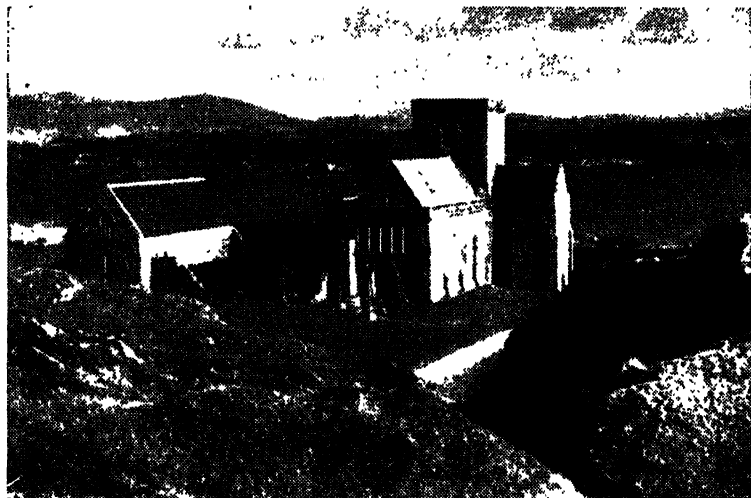
Columba, Columbidae, see PIGEON.

Columba Noachi (Noah's Dove), small constellation in the S. hemisphere, close to Canis Major and Lepus. Puppis, Pictor, and Caelum are also near by.

Columban, or Columbanus, Saint (c. 545-615), Irish monk and missionary,

whose feast is celebrated on 21 Nov. B. in Leinster, he entered the great Celtic monastery of Bangor in Ulster. In 580 he led a band of monks on a missionary journey to the Continent, where he preached with success in Brittany and the Vosges, and founded the abbey of Luxeuil. His denunciation of the Frankish court led to his exile; he went to N. Italy and founded the abbey of Bobbio, where he d. His followers embraced the Rule of St Benedict, and thenceforward exercised an important influence on W. civilisation (see ST GALL). The Maynooth mission to

W. slope of the Rocky Mts., 80 m. N. of the U.S. line. Second to the Mississippi in vol. among U.S. rivs., it drains a basin of 259,000 sq. m., including most of Idaho, Washington, and Oregon, and parts of Montana, Wyoming, Nevada, and Utah. In the Big Bend region is the Grand Coulee, the site of a large irrigation reservoir of the Columbia R. project. Its course at first is S. through various lakes, till it reaches the N. border of Washington. It then continues its course irregularly to the Oregon frontier, before reaching which it receives, on the l.b., the Spokane



The Iona Community

THE CATHEDRAL CHURCH OF ST MARY, IONA, AND MONASTERY BUILDINGS

The existing buildings were originally founded by Benedictines, c. 1203, near the site of St Columba's church, c. 563. The church has been restored by the Church of Scotland, and the monastery buildings by the Iona Community.

China is dedicated to St C. and the missionary priests are trained at St C.'s College, Dalgan Park, Navan.

Columbarium (Lat. *columba*, dove), name of the niches or buildings for the storage of sepulchral urns containing ashes of the dead. The fancied resemblance between a dovecote and the niches round the walls of Rom. burial-chambers gave rise to the name. Such tombs were mainly used for the poorer classes, and were erected by wealthy families for their slaves, or by funeral associations under the empire. Examples near Rome are those of the Vigna Codini at the Licinian Gardens. The *ustrina* were attached to the *columbaria*. In modern times C. means a room connected with a crematory, provided with niches for the funeral urns.

Columbia, with the exception of the Yukon the largest riv. of the W. side of America, rises in Brit. Columbia on the

R. and the Snake R., the latter being its largest trib. It then turns W. once more, and flows along the N. border of Oregon, casting itself into the Pacific by an estuary about 35 m. long and from 3 to 7 m. wide. Its mouth forms a deep-water harbour; ocean-going ships pass through a channel to the mouth of the Willamette R. and the ports of Portland and Vancouver. Bonneville Dam is at the head of tide-water. The C. passes through a mountainous country, and its scenery is remarkable. The salmon fisheries flourish (39,000,000 lb. annually), and there are large canning stations at the mouth of the riv. The falls, however, make clear navigation possible for only 160 m., up to the Cascades. Above these there is another navigable stretch of 50 m. reaching to The Dalles. Canals, however, allow riv. boats to go farther upstream. The C. is 1200 m. long.

Columbia: 1. Cap. and largest city of S. Carolina, U.S.A., on Congaree R. just below the falls; it is navigable to this point. C. is an important railway, trade, and distributing centre, with manufs. of cotton goods and cars, large iron-works, and trade in cotton. The state univ. was founded in 1805. Allen Univ. and Benedict College (both Negro) and Columbia Bible College are also here. Near by is Fort Jackson, a large U.S. Army post. There are many fine public buildings. C. was occupied by Gen. Sherman in Feb. 1865, and much of it burnt. Pop. 86,915, many coloured.

2. Cap. of Maury co., Tennessee, U.S.A., on the Duck R. 40 m. SW. of Nashville, in fine farming country. Many mules are raised and there are flour mills, etc. There was fighting here during the Civil War. Pop. 10,900.

3. City, cap. of Boone co., Missouri, U.S.A., in agric. and coal-mining area 20 m. NW. of Jefferson City. It manufs. shoes and clothing and is the seat of the Univ. of Missouri and Stephens College. Missouri State Historical Society Library is here. Pop. 32,000.

Columbia, British, see **BRITISH COLUMBIA**.

Columbia, District of, the seat of gov. of the U.S.A. It is an artificially rectangular piece of ter. of some 69 sq. m., within the ambit of the state of Maryland. After the Amer. colonies achieved their independence and formed themselves into a new nation, Philadelphia was at first the cap. But as there were in the beginning sharp jealousies between the various states, it was deemed wise to establish a cap. about midway between the N. and S. states along the Atlantic sea coast, this ter. at that time comprising all the U.S.A. Originally an area of 100 sq. m. was ceded for this purpose by Maryland and Virginia, but in 1846 Virginia's portion S. of the Potomac was given back to that state. The Potomac R. flanks the dist. for its entire length to the S., and also flanks part of the perimeter of the city of Washington. Since an Act of Congress of 1895 the city of Washington has been co-extensive with the dist. The dist. was formally estab. by Acts of Congress in 1790-1. Under these Congress itself assumed entire jurisdiction. Congress first met in the dist. in 1800. John Adams, second president of the U.S.A., was inaugurated in Philadelphia, but was the first chief executive to live in the White House in Washington. Thomas Jefferson, third president, was the first one to be inaugurated in Washington. The feature of the dist. is that the gov. is by Congress directly as to legislation and by three executive commissioners named by the President and confirmed by the Senate. Each house of Congress has a special committee on dist. affairs. The result is that the dist., and Washington in particular, have not grown up in a haphazard fashion, but according to a fixed plan, with the determination to make the cap. one of the most beautiful in the world. Another peculiarity about the dist. is that persons born there are

practically disfranchised. There are no municipal elections, because the gov. is in the hands of the executive commissioners and Congress. In presidential election natives of the dist. have no vote. The total pop. is 802,178. There are many industries in the dist., goods being produced primarily for local consumption. The revenue of the dist. is raised by real estate, personal, and business taxes, and from treasury grants in aid. Univs. are Georgetown, under the Jesuits; George Washington, non-sectarian; Howard, for coloured students; the Catholic Univ. of America; the National Univ.; and the Amer. Univ. Trinity College is also here.

Columbia University, New York City, was founded as King's College in 1754, reorganised as C. College in 1784, and became C.U. in 1896. It is one of the most important educational institutions in America, and owes much to Nicholas Murray Butler (q.v.), who was president 1902-45. The leading colleges are C. for men undergraduates, Barnard (founded 1889) for women, and Teachers (founded 1888—a part of C. U. since 1898). In addition there are faculties, schools, or colleges of arts, political science, philosophy, pure science, mines, engineering, chemistry, law, medicine, pharmacy, architecture, journalism, business, and social work; also Russian, E. Asian, European, and accounting institutes. The combined libraries had 3,000,000 volumes in 1956. There was a teaching staff of 4285, and the students numbered 27,000. The C. U. Press was founded in 1893. Gen. Dwight D. Eisenhower was president 1948-53. See also **BARNARD COLLEGE**.

Columbine, or *Aquilegia vulgaris*, a perennial herb, Brit. and European species of Ranunculaceae, which grows wild and is cultivated in variety as an ornamental plant. Leaves are spirally arranged, bi-ternate; flowers are sev. to a stem, with 5 petaloid sepals, 5 petals, each with a long nectar-secreting spur, and numerous stamens, arranged in whorls of 5. The androecium matures before the gynaeceum, and fertilisation is effected by long-tongued humble-bees seeking pollen and nectar.

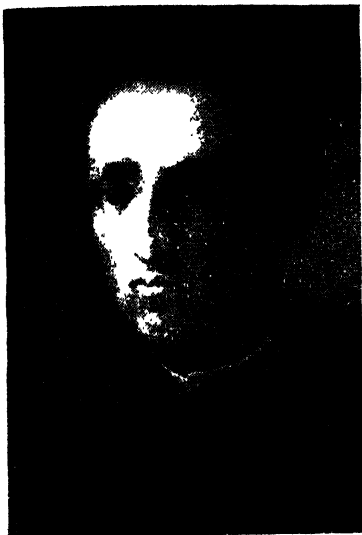
Columbine, see **HARLEQUINADE**.

Columbite, niobate and tantalate of iron. It occurs chiefly in pegmatite veins, bearing tantalite, cassiterite, and wolframite, in the Black Hills, S. Dakota, and in W. Australia.

Columbium, alternative and less usual name for the chemical element Niobium (q.v.).

Columbus, Bartolomeo (d. 1514), brother of Christopher. He was an excellent cosmographer and produced many ingenious globes, maps, and sea charts. He is said to have been deputed by Christopher to lay his project of exploration before Henry VII of England, but to have been delayed by pirates till after the patronage of Ferdinand of Spain had been obtained. He took part in his brother's discoveries, and was honoured together with him in 1493. In 1494 he went to San Domingo, of which he became governor, and where, after sev. expeditions, he d.

Columbus, Christopher (Latinised form of It. Cristoforo Colombo; Sp. form Cristóbal Colón) (c. 1446–1506), famous navigator and discoverer of the New World, b. near Genoa, where his father was a wool-carder. The exact date of his birth is uncertain, authorities varying from 1436 to 1457, but 1446 is the most probable. It is said that for a time he followed his father's trade, but he was certainly at sea before the age of fifteen. The accounts of his early voyages are doubtful and obscure, but they extended over a vast range, from the Levant to



Museo Naval, Madrid

CHRISTOPHER COLUMBUS

Iceland. In 1470 he was wrecked off the coast of Portugal, near Cape St Vincent, but he came ashore on a plank, and settled in that country. Before 1480 he had married Felipa Moñiz, the daughter of Bartholomeo Perestrelo, an important navigator and captain, first governor of Porto Santo. For some years C. had been in correspondence with Paolo Toscanelli, the Florentine astronomer, as to the possibility of reaching Asia by sailing westward. This project was present in his mind as early as 1474, and had been fostered by the reports of seamen, rumours heard in Iceland, and the surmises of the ancients. His hypotheses were fairly correct. He realised the spherical form of the earth, but he underestimated its circumference. When, in addition to this, he over-estimated the size of Asia, his idea of the distance he must go was about one-third of the correct one. It was necessary for him to find

some sovereign to support him in his enterprise. He applied first to John II of Portugal, and then by letters to Henry VII of England. He visited Spain and applied to the powerful dukes of Medina Sidonia and Medina Cell, and this latter nobleman referred him to Queen Isabella. After some seven years of journeying, persuasion, and uncertainty, C. at long last succeeded in obtaining the help he required. On 3 Aug. 1492 he set out from the tn of Palos with one ship of 100 tons, the *Santa Maria*, and two caravels, the *Pinta* of 50 tons and the *Niña* of 40 tons. He first went to the Canary Is., and thence, on 6 Sept., the expedition really set out. His men were insubordinate and discontented from the beginning. Whatever happened they interpreted in an adverse manner, and the variations of the magnetic needle reduced them to great terror. On 12 Oct. an is. was sighted, and named by C. San Salvador, now probably Watling Is. The expedition then cruised in the neighbourhood, discovering Cuba and Hispaniola or Espanola (Haiti). On this latter is. the *Santa Maria* went aground and had to be abandoned, and C. was compelled to return to Europe with the two caravels. Here he was received with the greatest enthusiasm, and honours were showered upon him. After six months in Spain he started westward once more, on 25 Sept. 1493, with a larger squadron and 1500 men. On this voyage the is. of Dominica was discovered. The great explorer, however, found the task of governing his colonies beyond his power, and after vexatious quarrels and illness he returned to Spain in 1496. In 1498 he made his third voyage, on which he reached the mainland of S. America, though he had coasted it as far as the Orinoco before he discovered its character. Many complaints had meanwhile been sent home from the colonists, and Ferdinand withdrew his favour from C. In 1499 a governor was sent out to supersede him, and he himself returned to Spain in chains. On his arrival the tide of popular feeling again turned in his favour and he was released with fresh honours, and in 1502 he made his fourth and last voyage in search of the passage to India. After exploring the gulf of Mexico he returned to Spain, and d. in none too prosperous circumstances at Valladolid. See Fernando C.'s life of his father (Eng. ed., 1867), and biographies by Washington Irving, 1828; Sir A. Helps, 1869; H. B. Adams and H. Wood, 1892; and Sir C. L. Markham, 1893. See also R. H. Major's trans. of his *Select Letters* (Hakluyt Society), 1847; H. Harrisse, *Christophe Colomb*, 1884, and *Christophe Colomb devant l'histoire*, 1892; M. André, *Christopher Columbus* (Eng. trans.), 1928; A. de Hevesey, *The Discoverer* (life and adventures) (trans.), 1929; *The Voyages: Journals of First and Third, and Letters concerning the First and Third Voyages* (including an account of the second voyage, by A. Bernaldez), ed. by C. Jones, 1930; S. de Madariaga, *Christopher Columbus*, 1939, 1949.

c.

b. his brother's discovery, and accompanied him on his second voyage. In 1493 he commanded the commission entrusted with the temporary gov. of Hispaniola, but was unsuccessful, and was sent back to Spain as a prisoner in 1500.

Columbus, Samuel (1642-79), Swedish author, a friend and pupil of G. Stiernhielm (q.v.). He is especially noted for his hymns, which are the first genuine ones in the language. Among his works are *Den Bibliske Verld* and *Odae Svetice*, in which he follows the Ger. poet Opitz. See R. Ekholm, *S. Columbus*, 1924.

Columbus: 1. Cap. of Ohio, U.S.A., on the Scioto R. 103 m. NE. of Cincinnati, and an important trade, distribution, and industrial centre. The streets are handsome and broad, and there are splendid buildings, including the capitol and Ohio State Univ. (20,500 students). There is a stadium with 78,600 seats, and the libraries include Ohio State Univ. Libraries, Ohio State Archaeological and Historical Library, Ohio State Library, and C. Public Library. Other points of interest include C. Gallery of Fine Arts and the Battelle Memorial Institute. Pop. 375,900.

2. City of Georgia, U.S.A.; one of the leading industrial centres of the S. of the U.S.A. The falls of the R. Chattahoochee generate electricity. It is a cotton market and an industrial and shipping centre, with textile mills, foundries, farm products processing plants, and railroad shops. It manufs. clothing, yarn, fabrics, machinery, electrical equipment, agric. implements, fertiliser, and food products. The first cotton-mill worked by electricity was in C., and artificial ice was first made here on a commercial scale, and industrial training provided by public schools. Pop. 79,611.

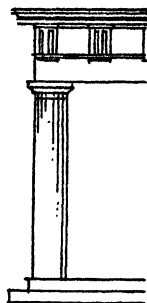
3. City, cap. of Bartholomew co., Indiana, U.S.A., 40 m. SSE. of Indianapolis. It manufs. Diesel engines and wood and metal products. A large prehistoric Indian mound is near. Pop. 18,400.

4. Cap. of Lowndes co., Mississippi, U.S.A., on the Tombigbee, has timber and cotton industries. The Mississippi College for Women, with 1100 students, is here; 1500 soldiers, victims of the Civil War, were buried in Friendship Cemetery. Pop. 17,200.

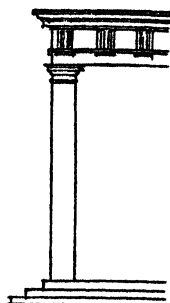
Columella, Lucius Junius Moderatus, Lat. writer on agriculture of the 1st cent. AD. B. at Gades in Spain, lived partly in Syria, but chiefly at Rome; probably d. at Tarentum. His chief work, *De Re Rustica*, the fullest anc. treatise on practical agriculture, consists of 12 books in dactylic hexameters, and is addressed to a certain Publius Silius. The style is easy and copious, but the information is often of doubtful accuracy and seems to have been derived from books. There is an ed. by V. Lundström, 1897, and another (still incomplete) with trans. by H. B. Ash (Loeb Library, 1941 ff.).

Columnkille, see COLUMBA, ST.

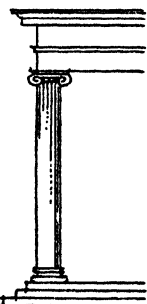
Column, in architecture, a vertical and



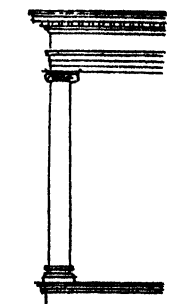
A



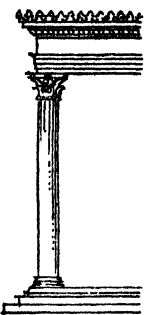
B



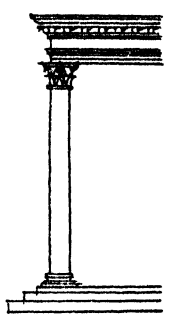
C



D



E



F

COLUMN: THE CLASSICAL (GREEK AND ROMAN) ORDERS OF ARCHITECTURE.

A, Greek Doric; B, Roman Doric; C, Greek Ionic; D, Roman Ionic; E, Greek Corinthian; F, Roman Corinthian.

cylindrical member; usually supporting a load, but occasionally detached, as a commemorative monument, e.g. Nelson's C., London. Normally a C. consists of

three parts: capital, shaft, and base; but certain early types of C. (e.g. Gk Doric) had no bases. Anct Egyptian C.s were massive and often clumsy in design, without bases. Slender C.s formed a notable feature of Assyrian and Persian architecture. Gk architecture (q.v.) was 'trabeated,' i.e. based upon C.s and beams. The three types of C.s invented and used by the Gks were described by the Rom. architect Vitruvius (q.v.) under names which have been adopted ever since—'Doric,' 'Ionic,' and 'Corinthian.' Vitruvius formulated standard rules for each of the three types, prescribing the correct relation of diameter to height in each case, and relating these dimensions to the series of beams—the 'entablature' (q.v.)—which the C.s supported. His rules came to be known as 'The Orders of Architecture,' and were followed by Rom. architects of his own time, also throughout the Renaissance. They still play a most important part in architectural design. The three types are shown on the illustration here. The Gks favoured the Doric Order, using the Ionic less frequently, and the Corinthian very seldom. The Romans favoured the Corinthian. The so-called 'Tuscan Order' was an unimportant Renaissance variant of the Rom. Doric, and the 'Composite Order' a rare Rom. variant of the Corinthian. Both Gk and Rom. C.s were subtly swelled, not merely tapered, the swelling being termed the 'entasis' (q.v.). Except in the Doric Order, the capital (q.v.) was carved into ornamental forms. Byzantine, Romanesque, and Gothic C.s and capitals did not strictly follow the classical Orders, but owed many of their features to them. Rom. architecture was essentially 'arcuated' (i.e. based primarily upon the arch-form); and where the Romans introduced C.s from their Gk predecessors, they used them structurally in colonnades round their temples, etc.; but also applied them, for purely decorative purposes, to arcuated buildings, e.g. the Colosseum (q.v.).

Column, military formation in which the units are arranged one behind the other, sev. ranks in depth. When military science was less developed, the European armies always fought in C., the soldiers of Napoleon invariably using this formation. The one exception was the Eng. Army, which always preferred the line. The advent of the breech-loading rifle, making it still more advantageous than formerly to have a long fighting front, led to the giving up of the columnar formation and the general adoption of the line. Reserves, however, still move in C., as this method is easier for movement. A Brit. battalion in C. has its four companies disposed one behind the other in parallel lines, the distance between each pair being equal to the front of one company. In half-C. this distance is halved, and in quarter-C. it is reduced to six paces. When cavalry moved in squadron C., the four troops which composed a squadron were arranged one behind the other in such a manner that a wheel to either side would bring them into line. There are various other minor distinctions of columnar formation,

according to the kind of troops employed, and the term is often used somewhat vaguely to describe any body of troops moving rapidly. Thus we speak of C.s of artillery, supply C.s, and C.s under the command of a certain general.

Columna Rostrata: 1. Triumphant pillar in the forum at Rome commemorating the victory of Dullius over the Carthaginians off Mylae in 260 BC. The name originated in the fact that the column was decorated with the beaks (*rostra*) of the vessels which had been captured.

2. A book of this name, dealing with the Brit. Navy, with special reference to the Dutch wars, was written by Samuel Collier in 1727.

Colunga, Sp. tn in the prov. of Oviedo, near the coast of the bay of Biscay. It is famous for its apples, and there are anthracite mines near by. Pop. 8000.

Colutea, genus of leguminous plants, consists of hardy shrubs, all of which are found in S. Europe, in Palestine, and in the Himalaya. *C. arborescens*, the bladder-senna, is often cultivated as an ornamental plant. The fruit is an inflated legume, and the leaves are frequently used in the adulteration of senna.

Colville, Sir Charles (1770–1843), general who served against the Irish rebels in 1798, in the Ferrol expedition of 1800, the Egyptian expedition of 1801, the Peninsular war of 1810–14, and in Belgium, 1815. In 1819 he became commander-in-chief at Bombay, and in 1828 governor of Mauritius.

Colville, Sir Henry Edward (1852–1907), soldier. His first experience of active service was in the Sudan campaign of 1884. During 1884–5 he served with the Nile expedition. He was acting-commissioner in Uganda from 1893 to 1895, and commanded the Unyoro expedition. In 1899 he went out to the Cape at the outbreak of the S. African war in command of a brigade of guards. He served under Lord Methuen at the battles of Belmont, Modder R., and Magersfontein; later given command of the 9th Div., and assisted in the operations leading up to the battle of Paardeberg in Feb. 1900. Owing to the unfortunate engagements at Sanna's Post in Mar. and at Lindley in May, C. was superseded and recalled to England in July. Among his pub. works are *The History of the Sudan Campaign*, 1886, and *The Work of the Ninth Division*, 1901.

Colvin, Sir Sidney (1845–1927), literary and art critic, b. London. In 1876 he became director of the Fitzwilliam Museum, and in 1884 keeper of the prints and drawings at the Brit. Museum. His works include contributions to many leading periodicals and to the *Dictionary of National Biography*; *Landor*, 1881; *Keats*, 1887, both in the English Men of Letters series; *A Florentine Picture-Chronicle*, 1898; *Drawings by Old Masters at Oxford*, 1902–8; *Engraving and Engravers in England*, 1906. He has also ed. *Selections from Landor*, 1882; *Letters of Keats*, 1887; *Works of R. L. Stevenson* (Edinburgh ed.), 1894–7; *Letters of R. L. Stevenson*, 1899, 1911; *John Keats: his Life and Poetry, his Friends, Critics, and After-fame*, 1917;

Memories and Notes, 1921. See E. V. Lucas, The Colvins and their Friends, 1928.

Colwyn Bay, watering-place in Denbighshire, Wales, 4½ m. N.E. of Conway, with a fine sandy beach. Pop. 22,240.

Colza, or **Rape Oil**, is obtained from the seeds of *Brassica campestris oleifera*, by expression or by extraction with a solvent. The crude oil is dark brown and has an unpleasant taste and characteristic odour. When refined it is a pale yellow liquid and free from taste and odour, but is inclined to revert in flavour and acquire an unpleasant taste. Its sp. gr. is about 0.912. It can be 'blown' like linseed oil (q.v.). C. O. is heated with sulphur to produce dark factice or treated with sulphur chloride to produce white factice, both of which are used as rubber substitutes and in rubber compounding. The oil is also used in lubricants, as an illuminant, for oiling wool, and as a quenching oil in tempering steel. When refined it is sometimes used for edible purposes—in the manufacture of ghee-substitute. The cake remaining after extraction of the oil may be used in cattle foods, but as mustard seed often becomes mixed with rapeseed and is injurious to cattle, the cake residue is often used as a manure. The plant is cultivated chiefly in China, India, Pakistan, Japan, and Sweden.

Coma (Gk *koma*, deep sleep), condition of absolute unconsciousness in which the patient does not react to external or internal stimuli. The patient is totally insensible to his surroundings. C. may be due to disease or injury of the brain or to the effects on the brain of poisons, certain drugs, and toxic substances in the blood resulting from various diseases. C. may also result from cerebral anaemia and is thus the terminal state in conditions in which there is circulatory failure. See also UNCONSCIOUSNESS.

Coma Berenices (Berenice's Hair), in astronomy, a small cluster of stars in the N. hemisphere near the equinoctial colure. It is said to have been so named by Conon to console Berenice, the wife of Ptolemy Evergetes, for the loss of a votive lock of her hair which had been stolen from the temple of Venus. Its definite location is generally ascribed to Tycho Brahe (1602). The cluster has now been accurately measured by Dr Chase from Yale Observatory.

Comacchio, It. tn, in Emilia-Romagna (q.v.), 28 m. S.E. of Ferrara (q.v.). It has ancient walls and a cathedral. The tn is 3 m. from the Adriatic, and is built amidst shallow lagoons (Valli di C.) known for their fisheries. There is a trade in preserved eels and other fish, fruit, and salt. Pop. 14,000.

Comanches, tribe of N. Amer. Indians belonging to the Shoshonean stock. The C. now number about 2500, and are found in the Kiowa agency, W. Oklahoma. They were originally fierce, restless, and courageous prairie Indians, and were for long a constant terror to white settlers on the Mexican and Texan frontiers. They were largely instrumental in introducing horses to the Plains Indians, giving them greater power in war.

Comayagua, dept of Rep. of Honduras. It is mountainous, with some fertile plains, and watered by the Sulaco and Humuya R.s. Contains numerous prehistoric remains. Agriculture is carried on in the valleys. There is gold and silver mining and felling of timber trees in the primeval forest. Big game abounds. Area 1819 sq. m. Until 1880 C., its cap., was the cap. of Honduras under the name of Valladolid. Pop. (dept) 75,000; (tn) 4800.

Comb (Gk *gomphos*, pin, Ger. *Kamm*), toothed toilet instrument, used for cleaning and arranging the hair, for keeping it in position when dressed, and as an ornament for the head. The use of the C. is of great antiquity, and specimens have been found in ancient Egyptian, Gk, Rom., and early Christian tombs, and in Swiss lake-dwellings, being variously composed of wood, especially boxwood, bone, horn, and ivory. All these materials are still used in the manuf. of C.s, together with tortoiseshell, metal, india-rubber, xylonite, celluloid, etc. The one most commonly employed is horn, and there are two main methods of manuf. For both the horn is cut into rectangular pieces, damped and heated, and passed out flat. In the first method a series of fine slits, varying with the size of the teeth required, are cut on one side by a small circular saw, which has now superseded the 'stadde' or double handsaw. This involves considerable waste of material, but is the only method possible in dealing with some substances. The second method, known as 'twinning,' or 'parting,' invented by Lyne about 1828, utilises the wedges left between the teeth of one comb to form the teeth of another, so that all waste is avoided. C.s of vulcanite, xylonite, celluloid, nylon, etc. are made by moulding the soft material and afterwards hardening it.

Combat, Trial by, custom in England, according to the old laws, by which the two parties either in criminal or civil cases challenged each other to fight to decide the guilt or innocence of the accused. The idea was that if the evidence were insufficient the result of the combat would declare the actual truth. If the case were a criminal one the parties themselves fought, unless one of the two was a woman, or unfit in any way by reason of age or infirmity. In civil cases they were allowed to employ champions. At the beginning of the 19th cent. this custom was abolished, owing to the decision in the case of *Ashford v. Thornton*.

Combe, George (1788-1868), phrenologist and philosopher, b. Edinburgh. His works include *Essays on Phrenology*, 1819; *The Phrenological Journal*, founded 1824; *The Constitution of Man*, 1828, his ablest work; *Notes on the United States of North America*, 1841; *On the Relation between Religion and Science*, 1857. See life by C. Gibbons, 1878.

Combe, William (1741-1823), poet, b. Bristol. Educ. at Eton and Oxford, he afterwards travelled in France and Italy, lived in princely style, and was known as Count Combe. But lean years followed;

he was successively soldier, waiter, and cook, and spent much time in a debtor's prison. In 1776 he pub. a satire, the *Diaboliad*. From 1809 to 1811 he contributed doggerel verses to accompany a series of Rowlandson's illustrations in the *Poetical Magazine*. They were collected as *The Tour of Dr Syntax in Search of the Picturesque*, and were very popular. Dr Syntax reappeared in *A Second Tour in Search of Consolation*, 1820, and *A Third Tour in Search of a Wife*, 1821. C. also wrote a series of imaginary letters of the second or 'wicked' Lord Lyttelton, who was at Eton with him.

Comber, tn of co. Down, N. Ireland, on Strangford Lough. There are flax mills and distilleries. Pop. 3000.

Combermere, Sir Stapleton Cotton, sixth Baronet, first Viscount (1772-1865), field marshal. At 21 years of age C. commanded the 6th Dragoon Guards. He served through the campaign against Tipoo Sahib in 1799, including the battle of Malavelly and the siege of Seringapatam. He commanded the cavalry div. in the Peninsular War. In 1826 he besieged and took Bharatpur, a fort which 22 years earlier had resisted even Gen. Lake's skill and was indeed deemed impregnable. It was for this exploit that he received his viscounty. See *Memoirs and Correspondence*, 1866.

Combin, or Grand Combin, peak between Italy and Switzerland. It is in the Pennine Alps, and lies E. of the Great St Bernard, 9 m. SE. of Martigny. Elevation 14,168 ft.

Combination, in mathematics, see PERMUTATIONS AND COMBINATIONS.

Combination, Laws of. Till 1824 these laws forbade as common law misdemeanours any combination of masters or workmen to raise or lower wages, or to increase or diminish the hours or quantity of work. In addition thirty-five statutes prohibited combinations of workmen against masters. An Act in 1824 repealed all these laws, the rationale of which was the removal of all restraints on trade, and forbade all combinations characterised by some element of violent interference. The effect of the Act, whether anticipated or not, was to legalise the formation of trade unions for the purpose of controlling masters in the conduct of their business. Some limitations on this result were enacted by a repealing Act passed the following year, but there are now no laws against combinations other than the common or statute law against such as amount to criminal conspiracies. See CONSPIRACY.

Combination Tones (obsolete Resultant Tones), secondary musical sounds produced by certain intervals of two notes struck at the same time, in the nature of inverted harmonics, since they sound (all but inaudibly) below instead of above the generating notes. There are two kinds of C. T.: differential, produced by the difference between the two generating notes, and summational, produced by the sum of these two notes, i.e. in both cases the vibrations of these notes.

Combinatorial Analysis, see PERMUTATIONS AND COMBINATIONS.

Combine, term used in industrial warfare to denote temporary federation of employers, usually in one particular industry or related industries, for the purpose of protecting their common interests, whether by keeping up the price of commodities produced by them, or by reducing wages or the hours of labour, or by any other means. Such a federation was formed in London in 1911 of a great number of employers in entirely different industries by way of mutual protection against the effects of the very prevalent strikes of that year. The basic principle of a C. is that of defence, and therefore it is to be distinguished from a trust (q.v.), which is an amalgamation for all or most purposes, usually with the ultimate object of forcing up the price of certain articles. A C., however, is not always of a temporary nature, but sometimes denotes a consolidation of business interests, practically analogous to a cartel, a merger (q.v.), or a trust. The permanent C. is either 'horizontal' or 'vertical.' The horizontal C. is the result of the union of a number of firms doing similar business who wish to organise their production on the same basis and to profit from the technical improvement which a united effort makes possible. The vertical C. is that which exists between firms dealing with the same material but at different stages in its manuf. This combination between the interests of producer and manufacturer tends to suppress the middlemen's profits. Vertical C.s have been common in Germany and the U.S.A., and they increased in England after the First World War, notably among the industries connected with iron, steel, shipbuilding, paper, and soap. If the C. is not the result of absorption of the smaller industries by the larger, one company, known as the holding company, may sometimes hold controlling shares in each of the other constituent companies in the C. A C. may exist between a number of unrelated businesses. The future of the C. in Britain depends on the success of the 1948 Monopolies and Restrictive Practices Act and the Restrictive Practices Act, 1957, in dispersing monopolistic activities and maintaining a competitive economy.

Combine Harvester, see AGRICULTURAL MACHINERY AND IMPLEMENTS.

Combined Cadet Force, name given since 1939 to the Officers Training Corps, formed in March 1908 to provide students in schools and univs. with a standardised measure of elementary military training in order that they might eventually become officers in the Territorial and Reserve forces. Those who obtained certificates of proficiency were exempted from a portion of the examination for officers of those forces. The Corps was in two divisions—senior, which included univ. units, and junior, consisting of public school units. C.C.F. contingents are formed in schools where education is normally continued to the age of 17. The present scheme provides for a common basis of training

up to the standard of Certificate 'A', Part I, and for the formation of specialist Navy, Army, and Air Force sections for older boys. It simplifies the administration of the various cadet units in schools and makes it easier for schools to run cadet forces for all three services instead of for only one or two of them.

Combined Operations Command, formed in Britain during the Second World War and consisting of personnel of all three fighting services. Its primary function was to provide training for amphibian warfare, which comprises all kinds of offensive action from small raids to large assault landings. It was also the duty of the command to plan and carry out raids on the coasts of the enemy. A combined operation is defined as one in which 'two or more of the fighting services co-operate in order to strike the enemy with the maximum of effect at a chosen place and a chosen moment.' The C. O. C. had its own troops of which the 'commandos' formed a notable part. Combined operations are an inevitable consequence of sea power. Drake in the W. Indies in 1585, and Howard and Essex at Cadiz in 1596, showed how a combination of sea and land forces could inflict much damage on the enemy. Some 'conjunct expeditions,' to give them their 18th cent. name, achieved permanent results, e.g. the capture of Gibraltar by Rooke and Byng (1704), of Quebec by Wolfe (1759), and of Cape Town (1795). Some, like the expeditions to Walcheren (1809) and in the Gallipoli campaign (1915) were failures. Yet others, like the destruction of eighty Fr. ships in St Malo (1758), were raids designed to inflict loss in men, ships, and stores. It is in this last category that all combined operations against the Gers. fell until nearly the end of 1942, when an Anglo-Amer. army, supported by numerous ships and aircraft, landed in Fr. N. Africa (Nov. 1942) and, by so doing, altered the course of the war. Before this no more had been attempted than raids in varying strength on enemy coasts from Norway to France and Libya, though some, like the raid on St Nazaire in March 1942, made hist. The first troops specifically chosen for raiding were independent companies formed from volunteers from all the regiments of the regular army and trained for urgent use against the Gers. in Norway. From these companies was developed the idea of forming guerrilla bands known as commandos, from the Boer war parallel. It has been officially stated that commandos were formed because at the time (June 1940) there was no existing unit of the Brit. Army which could be made available for raiding operations, as the most stringent economy in weapons had to be exercised, everything being subordinated to the task of organising the defence of the Brit. Isles against invasion. When the independent companies were replaced by special service battalions, and these in their turn were converted into the commandos, the original conception of their tactical use was preserved, i.e. that they were to be

amphibious and learn first and foremost to co-operate with the navy. Among the most notable commando raids organised by C. O. C. were the raid on Bruneval radiolocation apparatus, which was successfully destroyed 27-28 Feb. 1942; the raid on Vaagsø, Norway (March 1942), which resulted in a minor battle over the fjords and some desperate street fighting; the raid on St Nazaire (also in March 1942), the chief features of which were the smashing of the lock-gates by blowing up the ship *Cambeltown* filled with explosives and the firing of delayed action torpedoes; the destruction of a large fish-oil factory on the Lofoten Is. (March 1941); a raid by guerrillas landing from the sea on Rommel's headquarters at Beda Littoria and on the It. headquarters at Cyrene, Libya (Nov. 1941); the storming of Diego-Suarez in Madagascar (May 1942); and the great raid on Dieppe (18-19 Aug. 1942). Subsequently combined operations formed part of all the major British military operations in World War II (Africa, Normandy, etc.). C. O. C. ceased to have general direction of operations of this character and these became the responsibility of the campaign commander. See also COAST DEFENCE; COMMANDO; DIEPPE RAID. See Ministry of Information, *Combined Operations*, 1943; Adm. Lord Keyes, *Amphibious Warfare and Combined Operations*, 1943; A. Vagts, *Landing Operations*, 1946.

Combining, see CARBON: WOOL.

Combining Weight, or Equivalent, of any element is the number of units of weight of that element which will react either directly or indirectly with one of the same units of weight of hydrogen. It is not possible always to make hydrogen compounds of all the metals, so sometimes the standard of comparison is taken as oxygen or even chlorine. But by the law of reciprocal proportions (see CHEMISTRY) it is easy then to determine the equivalent of the element; for the combining proportions of oxygen and chlorine with hydrogen are respectively 8 and 35.5 (approximately). Occasionally C. W.s of elements are the same as their atomic weights, although this is by no means universally true, e.g. the equivalents of carbon, oxygen, and sulphur are 3, 8, and 16 respectively, while their atomic weights are 12, 16, and 32. But from this it may be seen that the atomic weight is either the same as the equivalent weight or is a multiple of it, the multiple depending on the valency of the element. See ATOM AND ATOMIC THEORY; CHEMISTRY.

Combles, tn of France, in the dept of Somme. During the First World War severe fighting took place about C. during the 1916 battle of the Somme. The Gers. swept over C. in their final advance of March 1918, and in the Allies' counter-offensive held it with great determination during Aug., before being forced to abandon it. Its military importance was entirely due to its being the only tn in that area. C. has breweries and weaving industries. Pop. 760.

Combours, tn in the dept of Ile-et-Vilaine, France, 24 m. SSE. of St Malo.

Cheese and shoes are manuf. Chateaubriand (q.v.) lived in the feudal castle as a youth. Pop. 4400.

Combrailles, plateau in central France, largely in the dept of Cher (q.v.). The chief tn on the plateau is Evaux.

Combustion, a chemical reaction between at least two substances (of which one at least is gaseous) with the liberation of heat. This liberated heat must be sufficient to make the reaction self-supporting once it has been started. The burning of magnesium in steam and of phosphorus in chlorine are examples of C., and it must be noted that the gas need not necessarily be oxygen or air. C. may or may not occur with the emission of light. Thus the burning of magnesium in oxygen produces both heat and light, whereas the rusting of iron produces only a very small quantity of heat. It is the rate of evolution of heat that decides whether light is emitted. In C. processes it is usual to regard one substance as being combustible and the other as the supporter of C., but the terms are only relative. Thus while a jet of coal gas will burn in air, a jet of air will burn in coal gas. During C. processes heat is evolved and a certain temp. is reached. This temp. may vary, depending on whether the C. is slow or rapid, but the heat evolved is always the same for the same two substances. If, during C. of a gas or vapour, the combustible substance reaches a definite temp., a flame is produced. This temp. is the ignition temp. Some substances are spontaneously inflammable because this temp. is below the normal temp. of the atmosphere. If the ignition temp. is higher than the temp. produced during C., then no flame occurs. Thus both nitrogen and oxygen can be ignited by an electric spark, but the ignition temp. of nitrogen in oxygen is higher than the temp. produced and so no conflagration occurs. If the ignition temp. were lower than the temp. produced, then a flash of lightning would remove all the oxygen from the air and render life impossible. See also FLAME; SPONTANEOUS COMBUSTION.

Comedia, term used in old Sp. drama, meaning a tragedy or comedy in three acts. It can be divided into two sections: (1) *Comedia de capa y espada* represented actors of middle-class life in everyday incidents. The characters were clothed in ordinary dress—the cloak and sword of the civilian. (2) *Comedia de teatro*, or *de ruido*, played by kings and princes. The actors were very richly dressed, and dramatic scenes were chosen.

Comédie Française, official name of the Théâtre Français, the national theatre of France, which dates its estab. from the year 1680, though we may carry it a little farther back. In 1658 Molière's company, playing under the name of L'illustre Théâtre, quitted the provs. and settled in Paris. At that time a rival company at the Hôtel de Bourgogne already held the field, but Louis XIV. who early took the new company under his protection, ordered the two to amalgamate in 1680 under the name of La C. F. This theatre, then the only one left in Paris, received

an ann. subsidy of 12,000 livres from the king. In 1687 the C. F. moved from the rue Guénégaud to more commodious quarters in what is now known as the rue de l'Ancienne-Comédie, where a large house had been built for it. Here it remained for nearly ninety years, producing the plays of Molière and of contemporary dramatists. In 1771 the C. F. was removed to the Tuileries, where the company played in a hall built on the site of the Hôtel de Condé, afterwards to be rebuilt as the Odéon. It remained here during the early part of the revolution, but political events led to such dissensions that a split occurred about 1790, which led to the break-up of the old Française and the estab. of two rival companies, the Théâtre de la Nation and the Théâtre de la République. These came to an end in a few years, and a gap occurs in the hist. of the company until 1802, when it was re-estab. by an edict of Napoleon. When at Moscow in 1812 Napoleon pub. a further decree, giving full regulations for the conduct of the theatre, and these regulations, with slight modifications, still govern the theatre. Sound films, however, have modified the veto on members appearing on any other stage. In March 1900 the C. F. was set on fire, and a considerable portion was destroyed, though the papers and works of art were saved. A grant of 200,000 francs was promptly made by the gov., and the work of rebuilding was immediately carried out. Many of the most eminent Fr. actors and actresses of recent years, whether of comedy or tragedy, have made their début at the C. F. or have been connected with it during part of their careers, e.g. Sarah Bernhardt, who made her first appearance there in 1882 and for nearly twenty years belonged to the company; Coquelin aîné, whose association with this theatre lasted for over thirty years; Réjane, Jane Hading, Mounet-Sully, Adrienne Lecouvreur, Dumesnil, La Claron, Talma, Mars, and the Guitrys. The State owns the Théâtre Française and grants it to the Comédie with certain funds for maintenance, and with an administrator who is appointed by the minister of fine arts. Students after matriculation at the Conservatoire may become *pensionnaires* and receive a contract. Later they can become, and remain, *sociétaires* (i.e. *pensionnaires* co-opted by the partner-members). The training of the young players is severe; they must be versed in all styles of Fr. acting to deal with the classic repertory of the Comédie, both to deliver the exacting tragic tirades (e.g. of Racine) on the one hand, and on the other to catch the very spirit of Molière. On the evening of 20 Oct. 1930 the C. F. celebrated the two hundred and fiftieth anniversary of its official creation. Its leading artistes are content, mainly because their position enables them to earn extra money elsewhere and on the films, to receive from the C. F. no more than an average of £800 a year. Its traditions and fame ensure steady receipts, and it has the privilege of engaging at a very

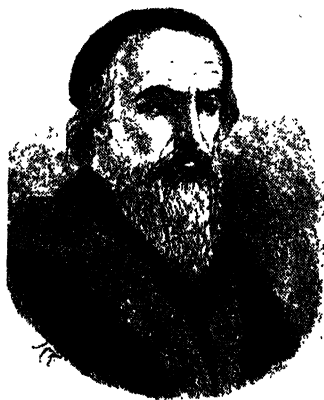
modest salary the prize-winners at the Conservatoire, who, as indicated above, are given a free dramatic training by the State and are bound to accept engagements offered at the C. F. In addition to these advantages it has an ann. subsidy of some £8000. See Fournier's *Le Théâtre Français*; De Jullieville's *History of French Literature*, 1900, which not only deals fully with the literature of the period, but also supplies an excellent bibliography; J. Claretie, *La Comédie Française de 1680 à 1900*, 1901; F. Sarcey, *A Company of Actors*, 1926; L. Dubech, *La Comédie Française d'aujourd'hui*, 1926; and S. Sclaud, *La Comédie Française*, 1936.

Comedy, see DRAMA.

Comedy Theatre, Panton Street, London, first opened in 1881 with the comic opera *La Mascotte*. Well-known actors and actresses such as Hawtrey, Beerholm Tree, Marion Terry, Penley, Winifred Emery, Violet Cameron, Cyril Maude, and Maxine Elliott have appeared there, and the works of Jerome, Barrie, Pinero, Grundy, Fitch, and Sutro have been performed at the theatre. It was rebuilt, and reopened in 1955 with the Amer. play *Morning's at Seven*, which was followed by Brendan Behan's *The Quare Fellow* and Peter Brook's production of Arthur Miller's *A View from the Bridge*, R. C. Anderson's *Tea and Sympathy*, and Tennessee Williams's *Cat on a Hot Tin Roof*.

Comenius (properly Komenský; Johannes Amos (1592-1671), distinguished scholar and educational reformer, b. Comna, in Moravia, or, according to another account, Niwnitz in the same dist. His parents were poor adherents of the Moravian Brethren. Having studied at Herborn (1612) and at Heidelberg, and having made a tour through England and Holland, C. became rector of the Moravian school at Prerau in 1614. After that he was made pastor at Fulnek, where he remained until 1621, when the tn was taken and sacked by the imperialists, his house and library being destroyed. He wandered into Poland, and finally settled at Leszno, where he supported himself by teaching Lat. It was here that he worked out the educational system which was to make him famous, and produced his *Didactica magna* in 1632, the year in which he was chosen elder of the Moravian Brethren. The year before this he had pub. the *Januae linguarum reserata*, written in Lat. and Moravian, which had securely estab. his reputation. This work was trans. into twelve European languages and sev. oriental ones. It was followed in 1633 by the *Januae linguarum vestibulum*, which formed an introduction to it. In 1641 he was invited to England by the Parliament, on the suggestion of Hartlib, to assist in the reformation of public educational methods. The outbreak of the Civil war put a stop to this design, and C. went on to Sweden, from which country he had received an invitation to aid in the same work. Oxenstierna, the great Swedish minister, commissioned him to prepare a plan for the regulation of Swedish schools, and settled him at Elibing with a pension. Here he remained

until 1648, when he returned once more to Leszno, and was made Moravian bishop of that tn. In 1650 he went as educational reformer to Hungary. Here he found time to put together his *Orbis sensualium pictus*, 1658, the first book which tried to instruct children by pictures. In 1656 Leszno was attacked and sacked by the Poles, and C. again lost his house and books. He found a refuge at Amsterdam, where he remained till his death. He was buried at Naarden. In his *Pansophiae prodromus*, 1630, he attempted to give an encyclopaedic digest of the humanistic learning of his time. In theology he was a fervent evangelical, and pub. sev. works



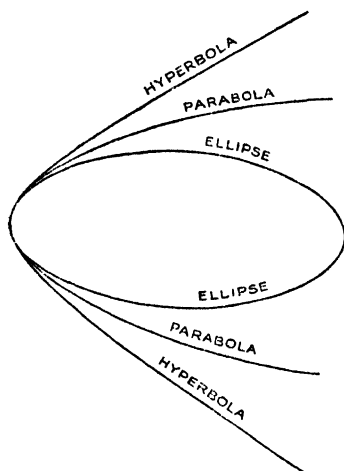
COMENIUS

on his own sect. See S. S. Laurie, *John Amos Comenius: Life and Educational Works*, 1881; M. W. Keatinge (trans.), *The Great Didactic*, 1896; P. Monroe, *Comenius and the Beginnings of Educational Reform*, 1900; R. F. Young, *Comenius in England*, 1932; J. Needham (ed.), *Teacher of Nations*, 1942.

Comeragh, mt range of Waterford, Rep. of Ireland, rising to 2597 ft.

Comet, heavenly body of a luminous and nebulous appearance which approaches to and recedes from the sun. The name is derived from the Gk *komētēs*, hairy, and is bestowed on these bodies because they generally possess a 'tail' or 'tails'; this tail in anct times also being called a beard when the train preceded the nucleus, as is the case when the C. is receding from the sun. Most C.s are divided into three parts, the nucleus and the coma, which together form the head of the C., and the tail. It is impossible to define exactly the limits of each of these parts, as they shade gradually into one another; quite often, too, a C. is without a tail, others again (as e.g. that of Cheseaux, 1744) may

have half a dozen. The nucleus is the brightest portion; the coma which surrounds it is a hazy area of light, while the tail becomes more and more faint and attenuated until it fades out. How attenuated is the matter that composes a C. may be judged by the fact that stars have repeatedly been seen through the thickest parts, and that the earth has passed through the tail of a C. without any observable effect. Thus Sir J. Herschel records that in 1832 he saw a group of stars of the sixteenth magnitude through almost the centre of Biela's C. The composition of a C. as revealed by the spectroscope (which was first successfully applied to determine the constitution of C.s by



ORBITS OF COMET

Sir Wm Huggins (in 1868) is of extreme tenuity, while metallic lines, such as those of sodium and iron, have been observed in the spectrum of the nucleus. The spectrum of a C. also shows that the light is partly reflected sunlight and partly original. Dr J. G. Porter's list of C.s in 1952 includes 737, but many of these refer to the same C.s at different returns, and only 525 individual C.s were then known. Of these, 274 had parabolic orbits, 52 hyperbolic orbits, and 199 elliptical orbits. Amongst the last were 114 with periods greater than 200 years. Of the 52 hyperbolic orbits, all of the C.s moving in these orbits were originally moving in elliptical orbits, and perturbations by one or more planets forced them into hyperbolic orbits. C.s break up by the expulsion of matter from the head of the C. Large C.s such as Halley's C. emit fresh matter forming new tails at each approach to the sun. The present view is that the cause of the expulsion is electrical in origin. The heads of the C.s contain reservoirs of the gases identified by spec-

troscopic analysis, and as meteoric masses are found to contain hydrogen and other gases it is considered that the heads of C.s are composed of meteors. Ultimately C.s will cease to exist when all the gases in their reservoirs have been lost. One of the more recently discovered C.s appeared on 23 June 1927, known as Pons-Winnecke, after its discoverer. A member of the Jupiter family, its nearest distance from the earth on that occasion was about 3,500,000 m., the closest approach of a C. in the past few cents. Its period is six years. Regarded merely spectacularly and historically, C.s have ever been the object of man's curiosity and sometimes his fear. Thus the dream of Julius Caesar and the battle of Hastings were believed to have been heralded by C.s, a representation of the latter C. appearing in the Bayeux tapestry. (See HALLEY'S COMET.) The most spectacular of the C.s of the 19th cent. was that found by Donati on 2 June 1858. Its tail stretched over a space of 40°, or nearly a quarter of the sky, and its maximum width was about 10°. The Arend-Roland (q.v.) C., discovered by two Belgian astronomers in 1956, was first seen by the naked eye in April 1957. It is of the non-returning category. Mrkos (q.v.) was discovered in Aug. 1957. See METEOR and SOLAR SYSTEM. See also George F. Chambers, *The Story of the Comets*, 1909; Charles P. Olivier, *Comets*, 1930; Mary Proctor and A. C. D. Crommelin, *Comets*, 1937; and J. G. Porter, *Comets and Meteor Streams*, 1952.

Comfort, Alexander (1920-), poet and novelist, educ. at Highgate, Cambridge, and London Hospital. In 1948 he became Lecturer in Physiology at London Hospital Medical College. His novels include *No Such Liberty*, 1941, *The Almond Tree*, 1943, *The Power House*, 1944, *On This Side Nothing*, 1948, and *A Giant's Strength*, 1952. *A Wreath for the Living*, 1943, *The Signal to Engage*, 1947, and *All But He Departed*, 1951, are vols. of verse; while *Into Egypt*, 1942, and *Gengulphus*, 1948, are plays. He also pub. sev. sociological works, including *Art and Social Responsibility*, 1946, *The Pattern of the Future*, 1949, and *Authority and Delinquency in the Modern State*, 1950.

Comfrey, name given to plants of the *Symphytum* genus, family Boraginaceae. *S. officinale* is the native C., with white to pink flowers; *S. asperum*, rough C., and *S. peregrinum*, blue or Russian C., are Caucasian introductions; *S. tuberosum*, tuberous C., is native to Britain in damp places.

Comillah, tn in the prov. of E. Bengal, Pakistan, in the Chittagong div. It is situated on the R. Guntl.

Comines, Philippe de la Clyte, Sire de (1445-1509), Fr. statesman and chronicler, b. at the château de Comines, near Lille. In 1464 he entered the service of Charles the Bold, but in 1472 went over to Louis XI of France, Charles's enemy, and soon became a great favourite of the king, who employed him on various diplomatic missions. On the death of Louis in 1483 C. incurred the displeasure of the regent, Anne de Beaujeu, and was condemned to

forfeited his estates. However, Charles VIII soon recalled him, and he was subsequently employed on diplomatic business by Charles and by Louis XII. His *Mémoires* (written c. 1488-1500) form a complete critical survey of the politics of the time. They are characterised by vigour and most acute observation and insight. Their psychological perception and vivid style unite to give them a rare value, and the first part of them is especially important for its unique portrait of Louis XI and his policies. There are sev. Eng. trans.



PHILIPPE DE COMINES

Comines, Fr. tn in the dept of Nord, on the R. Lys. It has textile and chemical manufs. Pop. 7200.

Cominform, the name given to the revival in 1947 of the Communist International or Comintern (which had been formally disbanded in 1943). The C. was formed by 9 European Communist Parties which announced their decision to set up an 'Information Bureau' (whence the name C.) in Belgrade. Between 1924-9, as the U.S.S.R. grew in power, the Comintern was increasingly drawn into the factional struggles through which Stalin gradually consolidated his personal dictatorship inside Russia—against Trotsky, Bukharin, and others; and gradually the dependence of international Communism on the Soviet Union became more explicit. During those years free public discussion of Comintern policy began to disappear, and after 1929, when Stalin's nominees, Molotov, Maniulsky, and Kuusinen, assumed the control of the Comintern apparatus, the C. became exclusively an instrument of the Russian State and public discussion has played no part in the formation of Comintern policy. The dissolution of the Comintern in 1943—dictated by its propagandist effect on Allied public opinion—was

entirely to the advantage of the Soviet Union, for the central direction and control of all Communist parties from a single source in Moscow remained unaltered. When the Second World War ended Communists tried to convert the National Liberation Fronts into National Front Govs. in which they could still retain the essential power, even if by remote control. But except in E. Europe, under the shadow of the Red Army (q.v.), this transformation could not be effected, for the fall of Hitler had removed the bond which united Catholics, Socialists, and Christians generally in resistance. Hence the necessity to revive the Comintern in a disguised form. The Cominform is intended to keep before public opinion the fact that Communism is an international movement working to a plan—and to exaggerate the strength of the movement in the eyes of its supporters and its enemies. In this respect the C. has not been unsuccessful, for there is scarcely any political disturbance from Alexandria to Bogotá or from Burma to Indonesia which has not been attributed to the machinations of the C. But so far the existence of the C., by an ironically dialectical process, has on balance damaged the Communist cause far more than promoted it. Opposition to the Soviet Union has always been most firmly rooted in the belief that she is planning and supporting a world-wide revolutionary movement. The Comintern was dissolved mainly in order to destroy the popular ground for that belief. By founding the C., however blameless and nugatory its real activities, the Communists have resurrected the old spectre. The part played by the C. in speeding the passage of the Economic Co-operation Act through the Amer. Congress was some evidence of this fact. The functions of the Communist International in directing and supporting the activities of world Communism remain, as before, the responsibility of the Russian State, a fact which was made evident in 1948 by the conflict with Marshal Tito over the industrialisation policy of Yugoslavia. The purpose for which the C. was founded was to exaggerate the strength and importance of world Communism, but by succeeding in this purpose the C. has largely contributed to the success of the policies which its sponsors wish to frustrate. See COMINTERN.

Comino, see GOZO ISLAND.

Comintern, the Third or Communist International. It was founded in 1919 in Moscow for the organisation of the revolutionary forces of the world. Membership obliged adherents to press vigorously all communist activities in affiliated countries. During the Second World War the C. proved more of a liability than an asset to Russia, and it dissolved itself in 1943, when the Presidium of the executive committee of the C. decided that unity in the struggle against Germany could best be achieved by the 'vanguard of the working-class movement in each separate country, working within the framework of its own country.' In fact it had held no

congress since 1935, while its executives with only very limited success, had continued the role of mentor to the Communist parties in other countries. This dissolution did not, however, mean that the influence of Moscow over the Communist movement in foreign lands would disappear, but it had become evident to Moscow that the C. had served as a rallying point for anti-Communist forces in other states. *See also* ANTI-COMINTERN PACT; COMINFORM.

Comiso, tn in Sicily (q.v.), 7 m. WNW. of Ragusa (q.v.). It has a castle and fine churches. Textiles, household utensils, and soap are manuf., and there is a trade in olive oil and wine. Pop. 23,400.

Comitan, tn in the state of Chiapas, Mexico, a customs station near the Guatemalan border, the centre of a large trade in fruit, maize, cotton, sugar, and cattle, with distilleries and textile mills. Pop. 8700.

Comitia, constitutional assembly of the Rom. people, summoned and presided over by a magistrate. There were three kinds of C., named according to the way in which the people were arranged. These were: (1) The *C. curiata*, the original form of assembly, which first consisted in the meeting of the patricians in their thirty *curiae*, or wards. On the breaking down of the distinction between patricians and plebeians, this assembly lost its distinctive character. Though it still retained one or two unimportant privileges, most of its duties were transferred to (2) the *C. centuriata*, an assembly of the whole people in their centuries as arranged by Servius Tullius. To this king is ascribed the div. of the people into five classes, according to the amount of property they possessed, and the div. of each class into hundreds. To this body the chief power belonged during the rep. It elected the higher magistrates, e.g. the consuls and censors, gave judgment in special cases of appeal, decided on wars of aggression, and passed laws. In 287 bc, however, it lost much of its power through the rise of the *C. tributa*. The *C. centuriata* was originally a military assembly, and its meetings could not take place in the city of Rome itself. They were held in the Campus Martius. Each century voted as a unit, according to the majority in itself, and so the decision was by centuries; (3) The *C. tributa* was the assembly of the people according to tribes, and the power of summoning it rested with the tribunes. Originally the city of Rome was divided into four tribes, but as its dominions increased the franchise was extended to comprise thirty-five tribes in all. Gradually power passed to the *C. tributa*, until it became the chief legislative assembly, and it continued in a more or less shadowy form down to the 3rd cent. AD.

Comity of Nations. In international law, C. of N. means a code of conduct, voluntarily observed in inter-state relations on grounds of courtesy rather than under treaty obligations. The application by law courts, in certain circumstances, of the principles of a legal system other than their own, is based on C.

Comma: 1. In music, the smallest interval, the 9th part of a tone. *See* MUSIC.

2. In grammar, *see* PUNCTUATION.

Commagene, anct. prov. in NE. Syria, lying between the Taurus and Euphrates. It retained its independence under the Seleucidae (q.v.), and was finally included in the Rom. empire by Vespasian. The cap. was Samosata on the Euphrates.

Command Papers, documents like blue-books, comprising reports of royal commissions, census returns, and other information collected or issued at the instance of the gov. C. P. are said to be 'presented to Parliament by command of Her Majesty,' in contradistinction to papers issued by the order of either House of Parliament, such as drafts of Bills with their amendments. They are usually numbered C 1, C 2, and so on up to the number issued. *See* BLUE-BOOKS.

Commandant, title usually given to the officer in command of a besieged fortress or military station, without regard to his rank otherwise. The name is also applied to the heads of most military schools. In conjunction with the rank of the officer the title is also given to an officer in charge of a greater number of men than his rank warrants, as for example captain-commandant.

Commander, title given to the capt. of the second rank in the Brit. Navy (equivalent to a lieutenant-colonel in the Army). A C. is generally given the command of a small vessel, but in a number of cases is the second in command of a large one. The responsibility of the navigation of a large vessel usually falls on a C.

The title is also used in the U.S.A. to signify a naval officer ranking next to a captain.

Commander-in-Chief was formerly the highest appointment in the Brit. Army. Before 1855 the office was to a very large extent independent of the secretary of state for war, but since that date and up to its abolition in 1904 was subordinate to that minister. The title was held by the Duke of Cambridge up to his death and afterwards by the Earl Roberts. It was resigned by the latter in 1904, and was discontinued. The duties of the office devolved upon the Army Council, formed in 1904. The title is now, in the Brit. service, borne in peacetime by those commanders who report direct to the joint chiefs of staff, e.g. C-in-C, M.E., C-in-C, F.E.L.F. In wartime it is usually applied to the commander of an expeditionary force, and is comparable to generalissimo in continental armies.

Commander of the Faithful (*Emir al Mumenin*), title of the caliphs, first assumed by Omar I, 634-44, and retained by his successors in the caliphate.

Commandery, dist. under a commander, of the Templars, Hospitallers, or other religious order. The Templars possessed 12 such C.s, which embraced whole kingdoms and provs. in Europe and Asia Minor, viz. Jerusalem (city and kingdom), Acre, Tripoli, Antioch, France, England, Poitou, Aragon, Portugal, Apulia, Hungary. The commanders, or preceptors,

were subject to the grand master of the order, but were alone responsible for the treasure of their dist., to which the grand master was allowed no access.

Commandino, Federigo (1509-75), It. mathematician, b. Urbino. He was especially learned in the commentation and trans. of the anc. mathematicians, and pub. many eds. of Archimedes, Euclid, etc. Nearly all subsequent commentators made use of his works.

Commandite, Société en, kind of limited partnership of a fiduciary character in which the managing partner or partners is responsible with his whole fortune for the engagements of the concern, but has others associated with him who contribute only definite sums, and are not liable for anything beyond those sums, though they participate in the profits according to any rule which may be agreed on. It is a form of partnership prevalent in France, Belgium, Germany, Italy, and other continental states, and adopted in parts of the U.S.A. The names of the active partners (in Fr. law called *commandites* or *complémentaires*) alone appear before the public, and they alone manage the partnership business, the dormant partners (in Fr. law *commanditaires*) being usually interdicted from all interference. Such partnerships are not allowed by Eng. law, all the members of an Eng. firm being equally liable for the firm's debts, with no limitation of liability. In England, however, practically identical results can be secured by the formation of a small limited company, and, especially since 1901, by what is known as a 'private company' (see *COMPANY*); the legalisation of the latter indeed depriving of a large measure of their weight the arguments of J. S. Mill on the indefensibility of the Eng. prohibition.

Commando, Afrikaans word meaning a small (usually mounted) battalion, the basic unit in the armies of the Transvaal and Orange Riv. Reps.; the word is applied to the raiding parties formed by the Brit. Army in 1940 and operating from ships for 'hit-and-run' attacks on the Germans. The C.s owed their existence to the inspiration of Gen. Dill, chief of the imperial general staff, supported by the zeal and authority of Winston Churchill, and their immediate *raison d'être* was to find some effective means of helping the army, after the Dunkirk evacuation, to exercise its offensive spirit once again. The term itself was derived from the Boer C.s of the S. African war, whose successful mobile guerilla tactics after the disorganisation of the main Boer army suggested to the Brit. authorities in 1940 the adaptation of the idea to the conditions of modern warfare and the employment of analogous tactics against the Germans, then masters of the Continent. Freedom from cumbersome supply columns and reliance on winning their equipment and, if need be, their arms from the enemy were the dominant features of the Boer C.s. For the Brit. C.s each trooper was picked for his individual qualities and taught to act on his own initiative. In a raid on the Continent the trooper would

have nothing but what he could carry and what he could forage for himself. The C. leaders were picked first—men under 40 and exceptionally well qualified in physical fitness and professional ability. The leader was given the rank of lieutenant-colonel and sent to command headquarters to raise his unit. From a list of officer volunteers each troop leader chose one other officer to act as his assistant; and then between them the two selected 50 N.C.O.s and men who composed their troop. Each man retained the right to go back to his regiment after giving reasonable notice, but few did. As soon as a unit had its complement of officers and men it was concentrated at a seaside tn, and the men of the 'irregular army' joined up with their corresponding numbers of the 'irregular navy.' These were the raiding flotillas of fast motor boats, commanded by R.N.V.R. officers, with yachtsmen and fishermen to form their crew. After rehearsal for a projected raid there followed the night dash across the sea, a few minutes for landing, then sharp fighting on shore, with E-boats and Stukas of the enemy in close pursuit, until in the end the C. returned home to restart training for the next attack. With the small boat squadrons of the navy they began in 1942 to pave the way for the landing of great armies, as in N. Africa, Italy (especially at Anzio), Normandy, and Burma. In such situations their role was usually to secure the flanks of the beach-head, and a tendency developed to group them in brigades for this purpose. Within these brigades the Marine element gradually came to prevail, and after 1946 C.s became exclusively a branch of the Marines (q.v.), which had originally been raised for just this purpose. Among the most noted C. raids were those on the Lofoten Is. and Vaagsø in Norway; the landings on Crete; the attacks on Bardia and Tobruk; and the raids on St Nazaire, Diego Suarez (Madagascar), Dieppe (see *DIEPPE RAID*), and Walcheren. C.s also fought together with U.S. Marine formations in Korea (autumn, 1950). See also *KEYES OF ZEEBRUGGE, BARON*.

Commedia (Gk *kómos*, revel, *aoidos*, singer), It. word, is applied to a tale or romance with a happy ending, and is not used particularly of a tale in the dramatic form, as is the word *comedy* in Eng. literature. Thus Dante entitles his great poem *Divina Commedia*, and likewise some of Chaucer's *Canterbury Tales* are called comedies in this sense.

Commedia dell'Arte, in the hist. of It. drama denotes the popular comedy of masks prior to its transformation into literary shape by Gozzi and Goldoni. *Arte*, in this connection, is equivalent to actors' guild or profession. The stock characters (to give them the names of their familiar Eng. equivalents) were the Clown, Harlequin, Columbine, and Pantaloon. This type of improvised comedy, or *commedia a soggetto*, is supposed to have been originated by Francesco Chereas, the favourite actor of Leo X. Its scenes were written only in *scenario*, i.e. in skeleton form,

being connected by the *lazzi* or buffooneries of the *arlecchino*, the representative of the older Rom. *sannio*. It was in this kind of comedy that Harlequin (*Arlecchino*) reached the apex of his glory. The *C. dell' A.* was essentially an actors' play; the dramatist only wrote an outline plot and left the actors to fill in the parts. Each actor took a particular mask part, such as those of Harlequin, Pulcinella, and Pantaloon, and always had his stock phrases and stock actions. More types were evolved in course of time, but they were all virtually comprised in the following, mostly developed from the older types: the Doctor, a poor ridiculous learned pedant; Pantaloon (Pantalone), named after Venice's patron saint, Pantaleone, and dressed in skin-tight trousers, who was sometimes an old bachelor but more often the husband of an unfaithful young wife or the father of vexatious young daughters, especially Columbine (Columbina, originally Frascotta), while Harlequin (*Arlecchino*) was sometimes his lackey (see *HARLEQUIN*); the Captain, a braggart poltroon taken from contemporary Sp. drama and modelled on the many unemployed Sp. soldiers of fortune then roaming Italy; the young lovers, often the sons of the old men and their sweethearts; the lackeys or *zanni*, *Arlecchino*, *Brighella*, or others, of varying degrees of doltishness, brutality, and sly cunning. Variants of these were Pulcinella, ancestor of Punch; Scaramouche (It. *Scaramuccia*) (q.v.), Scapin, Mezzetin, Pierrot, etc., all of whom had traditional costumes and often wore masks. Towards the end of the 16th cent. certain of the more famous It. troupes were invited to visit the various courts of Europe. In Italy the *C. dell' A.* remained popular until the tradition of improvised acting appeared to die out, towards the end of the 17th cent., and was replaced from the time of Gozzi and Goldoni by regular comedy. In France the permanent It. company gave offence to the king, and their theatre was closed in 1697, but reopened about 1720 and continued playing throughout the 18th cent. In England also this style of acting was reintroduced after the Restoration (it had reached this country in the reign of James I), but early in the 18th cent. it gave way to the more popular pantomime, in which the traditions of the *C. dell' A.* lingered on.

Pirandello, the modern It. psychological or metaphysical dramatist, has, to some extent, revived this traditional It. dramatic art or its later development in the masked comedy, for, like the writers of *scenarii* for masked players, he delights in constructing fantastic plots with unexpected situations and in embroiling them to such an extent that the unravelling has to be left to some individual character in the role of chorus or interpreter. The initiation of this new movement of the 'Teatro del Grottesco' is, however, attributed to Luigi Chiarelli, a young dramatist who, in 1916, produced a play called *La Maschera e il Volto* (*The Mask and the Face*) which enjoyed great popularity.

Commelin, John (1629-92), Dutch botanist, son of Isaac C., b. Amsterdam. He there became director of the botanical gardens, which by his skill and labour became the finest in Europe. He pub. sev. books on horticult. subjects. The genus of tropical plants *Commelina* is named after him, as also the family *Commelinaceae*, which includes this genus and *Tradescantia*, the spiderwort.

Commemoration, or *Encaenia*, concluding festival of the academic year at Oxford Univ., when benefactors are commemorated and honorary degrees conferred upon distinguished Brit. or foreign celebrities. It consists of an oration in Lat. in C. of benefactors; prize compositions are recited in verse or prose. The ceremony generally takes place immediately after the summer term when 'Schools' are over, and is held in the Sheldonian Theatre. 'C. Balls' are held during the festivities by groups of colleges.

Commendam, anct method of holding benefices, abolished in 1836. When a living fell vacant, its spiritual duties were given to some priest until a successor might be appointed, and the benefice was said to be held *in C.* The emoluments were later also given and poor bishops thus held sev. livings. *Commendators* were stewards appointed to take charge of the revenues of a vacant benefice.

Commensalism (Lat. *com* = cum, together, *mensa*, a table), an association of one organism with another advantageous to one or both without detriment to either (the term was used by Van Beneden). Care should be taken to distinguish it from parasitism (see *PARASITES*), an association harmful to one of the two organisms; and from symbiosis (q.v.), the most intimate form of association, illustrated by the union of algae and fungi, or fungi and plants. In one of the most interesting examples of C. a crab becomes covered with shells or sponges, etc. The sedentary growth is carried about to new feeding grounds and the crab obtains a disguise which aids it to capture its prey. The most striking form, however, is the association between the sea-anemone and the hermit crab. With one species of hermit crab (*Eupagurus prideauxii*) which is found off the Brit. coast a beautiful sea-anemone (*Adamania palliata*) is found in association. The anemone envelops the mollusc shell which the hermit has taken, and if disturbed the hermit withdraws into the shell, while the anemone throws out stinging threads. It is therefore a protection as well as a mask, and in return the crab carries it about and finds it food. The crab, as it grows, has to change its shell, and it takes the anemone with it. Then again in association with another form of hermit crab (*Eupagurus bernhardus*) is found a colony of zoophytes. In this case, however, the C. is not so perfect, for both organisms may be found existing separately. Again, even when they are associated, since the crab is carnivorous, and the zoophyte feeds on matter in the water, no sharing of food takes place, and the mutual advantage is harder to

understand. But when we bear in mind the fact that zoophytes obtain their food by means of slender waving tentacles, and they possess no means of setting up currents in the water, and the fact that the respiration of the hermit would keep the water constantly circulating, the advantage accruing to the zoophyte can be seen. The hermit, of course, in this case also, is masked from its prey; but this time, instead of the hermit moving as the shell becomes too small, the colony grow at the mouth of the shell and lay down matter which actually enlarges the shell, so prolonging the period during which the hermit can remain. Sometimes, again, as when a hermit has become



COMMENSALISM: COMMON HERMIT CRAB AND SEA-ANEMONES

On the left of the whelk shell is the hermit crab worm, which generally inhabits the upper whorls of the shell. Barnacles, other worms, and saddle oysters add to the hermit's retinue.

associated with sponges, the commensal grows so large that the hermit can abandon its shell and depend entirely for protection on its associate. Further, when the commensal of the crab is a polype, which buds into a colony, dissolving the shell as it grows, the hermit is finally surrounded by the polype, which yields as the hermit itself grows. But apart from these fixed commensals, a large number of organisms are in constant association without being connected. This may be because the same environment suits each, or it may be that one alone is, or perhaps both are, gaining benefit. Thus little crabs (*Pinnotheres*) can be found inside bivalves, and the same thing is common with crustaceans. The little crab benefits by obtaining food and oxygen from the currents inhaled by the bivalve. It has been suggested that these crabs with their developed sense organs can, by some means or other, warn their hosts of impending danger, thus causing them to close their shells. It is probable, however, that the advantage is in this case on the side of the intruder, and that the host is unable to eject it, even should it wish to. While

no damage is being done, it is easy to see how it is possible for C. to pass by slow degrees into parasitism. In a similar manner, not all insects visiting plants are parasites; very often they serve a good purpose by feeding on other visitors, and may therefore act as a defence for the plant.

Commensurable (Lat. *commensurabilitas*). Two magnitudes are called C. when they are of the same kind and each contains a third magnitude exactly, examples being a foot and a yard, or the numbers 14 and 21. If no unit or common measure can be found, the magnitudes are incommensurable, examples being the diameter and circumference of a circle, and in arithmetic numbers which are prime to one another, as 17 and 23. See also APOTOME.

Commentry, Fr. tn in the dept of Allier, on the Banne and the Cell. It has coal mines and iron works. Pop. 8800.

Commerce, Chambers of, see CHAMBER OF COMMERCE.

Commerce, Degrees in, see COMMERCIAL EDUCATION; UNIVERSITIES.

Commerce, Department of (American), one of the chief depts of the organisation for federal administration. The duties of its sev. heads are to promote commerce, mining, manufacturing, shipping, fisheries, patents, and transportation. The dept includes branches of aeronautics, radio, navigation, lighthouses, standards, steamboat inspection, census, coast and geodetic survey, fisheries, and mines.

Commercial Court is not a separate court estab. by law; the term C. C. applies to any court in the queen's bench div. to which may be assigned the disposal of cases included in the commercial list. Such as it is, the C. C. originated in the special arrangements made by the king's bench judges in 1895 for the dispatch of commercial business 'in accordance with the existing rules and orders.' There are no pleadings in the ordinary sense, but the plaintiff may submit 'points of claim,' to which the defendant may reply with 'points of defence'; nor is there a jury, the whole practice of the court being designed to ensure expedition in trial.

Commercial Education, educational facilities provided to meet the needs of those wishing to take up, or already engaged in, a commercial occupation. Often regarded as an aspect of technical education (q.v.). The activities associated with commerce might be studied under three broad headings: (1) buying and selling and the organisation of markets; (2) the structure of industry, trade, transport, and finance; and (3) the policy, organisation, administration, and direction of a business. Within each group various levels of training and a number of specialised skills are necessary. These include at the lower levels skills like bookkeeping, shorthand, and machine operating. Some knowledge of foreign languages has long been considered desirable. At the higher levels, business executives accepting the highest responsibility might be expected to have a thorough knowledge of economics, commercial law, personnel management, and

so on. Ancillary services like banking, accountancy, and insurance might be included in C. E. The commercial requirements of the 19th cent. were primarily for persons with sufficient skill in the three R's to become clerks. The expansion of industry, the growth of large corporations, the increasing complexity of business, and the introduction of more technical processes created in the 20th cent. a need in commerce for specialists. The response to this demand has varied from country to country. In the U.S.A. nearly a sixth of the students graduating from each college do so in business and commercial studies. Many leading univs. have estab. important graduate schools in C. E., and recently more than 25 have followed the Univ. of Harvard's example of offering short management courses for business executives. These facilities are supported by a considerable amount of C. E. in the public secondary schools. The Ger. speaking countries are noted for their commercial secondary schools and colleges which provide a variety of courses leading to further professional study in the technical univs. or to commercial occupations. In England, certain encouraging developments in the 19th cent. were checked. Consequently the growth since 1900 of C. E. has been unco-ordinated. Responsibility for it is shared by a number of agencies. Within the national system, a growing number of schools provide courses in economics, shorthand, bookkeeping, typewriting, and other commercial subjects. But the total number is not large and the percentage of entries in commercial subjects for the General Certificate of Education (1955) was little more than 1. Opportunities for pre-employment training are available in all three types of secondary school, although grammar school pupils frequently transfer at the end of their normal course to specialised commercial schools housed in technical colleges. Many private commercial schools exist attended by a considerable number of children under the school leaving age. A second type of private school offers short intensive secretarial courses for pupils who have left school. In technical colleges throughout the country students follow full-time, part-time, or evening courses in C. E. Chambers of Commerce, the Royal Society of Arts, and professional organisations have promoted C. E. by conducting examinations or by laying down professional qualifications. The examinations of the professional organisations are usually in three parts; the first is a preliminary test of general education, the second an intermediate examination in general commercial subjects, and the final one is usually highly technical in character. Finally the univs. are associated with C. E. through their degrees in commerce. Certain professional associations grant exemption from their intermediate examination to graduates who have taken specified subjects in their degree courses. At the London School of Economics and Political Science, commerce is included in the faculty of Economics and Political

Science; at Birmingham there is a faculty of Commerce and Social Science; at Leeds, Econ. and Commerce; at Liverpool there is a B.Com. degree; at Manchester a B.A. (Com.); and at Southampton a faculty of Economics and Commerce. See Ministry of Education report, *Education for Commerce*, H.M.S.O., 1949.

Commercial Federation, *see* CUSTOMS UNION.

Commercial Intelligence Department, inaugurated in 1899 as a branch of the Board of Trade under a controller-general, to collect all available information on all subjects of commercial interest and for the benefit of Brit. trade to reply authoritatively to all trade enquiries. In 1917 the C. I. D. was merged with the Dept of Overseas Trade (q.v.), which was itself absorbed into the Board of Trade after World War II.

Commercial System, *see* MERCANTILE SYSTEM.

Commercial Traveller. The modern C. T. may be defined as the direct representative of a manufacturer, merchant, or wholesaler employed to travel round specified areas to invite orders from retail tradesmen. He usually carries samples or some other indication of the nature and quality of the goods he 'travels in,' takes orders not in his own but in his firm's name, and is paid either by salary or commission, or by both. The C. T. of the coaching days was generally known as a travelling chapman (cf. Ger. *Kaufmann*, merchant), and as the ponderous public vehicles traversed only the main roads, many of the travellers who desired to penetrate into remote parts of the country had their horses and saddle-bags. Since the era of railways their numbers have increased enormously, and where formerly London, Manchester, and Glasgow trading houses sent 1 traveller to each in they now send many, each of whom deals with but 1 special dept instead of taking orders for all the classes of goods dealt in by his principals. In modern times the C. T. rapidly covers widespread ters. by motor-car and aeroplane. Among the organisations for the C. T. are the United Commercial Travellers' Association of Great Britain and Ireland (U.K.C.T.A.), the Commercial Travellers' Benevolent Institution, the Commercial Travellers' Christian Association, the Royal Commercial Travellers' Schools, U.K.C.T.A. Benefit Society, and the Commercial Travellers' Unemployment Society. The equivalent of the U.K.C.T.A. in the U.S.A. is the United Commercial Travellers' Association of America with H.Q. at Columbus, Ohio.

Commercial Treaties. A commercial treaty is a bilateral agreement between two nations under which each contracting party binds itself to observe a number of definite stipulations regulating their mutual trading relations. Such treaties have existed in one form or another from the earliest times. The text is extant of a C. T. between Rome and Carthage as early as 509 bc. C. T. during the period of Charlemagne, and in the 10th and 11th cents., existed in W. Europe in the

shape of royal charters, or other documents from sovereigns, expressly permitting foreign merchants to carry on commercial intercourse within their ters. The purpose of these C. T. made in more turbulent times was rather, through the medium of promises for the protection of the person, effects, and privileges of the foreign merchant, to make commercial intercourse reasonably possible than to adjust mutual relations for the economic advantage of either party; and further, they were of uncertain duration. The modern C. T., in the sense of bilateral arrangements for a fixed period regulating tariffs and differential duties, have their origin in the political and commercial rivalry of the medieval It. republics. The advantages derived from the greater certainty of a treaty over usage or the personal guarantees of a foreign monarch soon ensured the universal prevalence of C. T., providing for the greater security of navigation and commerce. At first C. T. were restricted to exclusive undertakings between the contracting states, the ultimate object being to destroy the competition of other nations in foreign markets, while at the same time excluding as far as possible all imports other than raw material. Later the most-favoured-nation article came into vogue. This article, which is susceptible of varying forms, has for its object the mutual extension to each of the contracting states of whatever rights and privileges each has already granted or conceded to some other state or states. An early instance of the most-favoured-nation article is afforded by the Turkish capitulations (see CAPITULATIONS), under which Turkey conferred certain rights and immunities to the subjects of Christian nations resident in the Ottoman dominions. The endeavours of various European powers, especially France and Germany, during the 17th and 18th cents. to introduce schemes of tariff reform by means of C. T. led to the formation of a number of treaties between England, those powers, and other European states, designed to lower the prohibitive rates on Brit. exports. Before the First World War Germany followed the old principle of exclusive C. T., having concluded or renewed in 1909 a number of treaties with Austria-Hungary, Belgium, Bulgaria, and Italy of a strictly protectionist character. The C. T. concluded between 1884 and 1900 regarding dials. and spheres of influence in various parts of E. W., and tropical Africa are universal in the recognition of the principle of most-favoured-nation treatment to the exclusion of all exclusive privileges. The advent of the First World War brought about a tremendous upheaval in the world of commerce. Nations which had been on friendly terms for years were now ranged in opposing camps, and the C. T. by which they had been bound for long periods were treated as mere scraps of paper. The depression in trade which naturally follows all wars set in after the First World War, and from 1930 began to be felt most acutely, not only in Europe,

but in all quarters of the world. The World Economic Conference, held in London in 1933, was convened in the hope of accelerating the flow of international trade by mutual arrangements for the stabilisation of currencies and by devising ways and means of raising commodity prices. But the conference completely failed in its purpose and served only to intensify the economic nationalism of each great nation. But Great Britain, having already reverted to a protectionist fiscal policy and concluded at Ottawa a series of trade agreements with the dominions (see OTTAWA CONFERENCE), was able in 1933 to conclude advantageous C. T. with sev. foreign countries, including Argentina and Denmark. See Hertslet's *Commercial Treaties*, 21 vols.

Commercy, Fr. tn, cap. of an arron., in the dept of Meuse, on the Meuse. There is a fine castle, now barracks. There are iron forges and weaving. Pop. 6200.

Communion (Cursing), the Office of, a solemn 'denouncing of God's anger and judgments against sinners' appointed to be read in the Anglican Church on Ash Wednesday. It is one of the last remains in the offices of the Anglican Church of the public acts of penitence which the primitive Church imposed at the beginning of Lent. The office is based on elements found in the Uses of Sarum and York. The curses contained in Deut. xxvii against impenitent sinners are read, and the congregation answer 'Amen' to every sentence as acknowledging the justice of the sentences. The *Miserere* (Ps. li) is then said, followed by prayers.

Commings (Lat. Convenae), old dist. of S. France between Armagnac and the Pyrenees.

Commiphora, synonym Balsamodendron, genus of tropical Asian and African trees, family Burseraceae. *C. myrrha* is a source of myrrh, a resin of bitter taste and peculiar odour; *C. africana* yields bdellium; and *C. opobalsamum* the Balm of Gilead (q.v.).

Commissariat, designated the dept responsible for the supply of food and forage for the army in the field. The transport of these articles was also in the hands of this dept, as were the responsibilities for the horsing of the army medical wagons and the ordnance store depts. The C. as a dept no longer exists; its functions are now carried out by the Royal Army Ordnance Corps and the Royal Army Service Corps, which between them provide the Army with arms equipment, stores, food, transport, etc.

Commissary, generally the representative of another. An eccles. C. is the deputy of a bishop, by whom the jurisdiction of the latter is exercised in distant parts of the diocese. A military C. is an officer whose duty it is to supervise the provision of food and clothes for an army. This term is still used in Scots Law in connection with the confirmation (q.v.) of executors. The supervision of such matters was originally an ecclesiastical concern and when it became a secular one the name C. Court was retained.

The C. Courts were amalgamated with the Sheriff Courts in 1876 but separate records are still kept, and the terms 'Commissary Office' and 'Commissariat' have been retained.

Commission, in business, denotes an agreed reward payable by a principal to his agent in consideration of the agent performing the particular business or service for which he was employed. The right of the agent to remuneration in the shape of C. may either depend on an express term in the contract of agency, or it may be implied from the custom in the trade, or from the general course of dealing between him and his principal. The agent is not entitled to make a personal profit out of the business into which he may enter on behalf of his principal other than the C. agreed upon. If the agent obtains such a profit he is bound to account for it to his principal (see also COMMISSION, SECRET), and further, the principal in such a case may not only repudiate the contract, but recover any C. he may have already paid to the agent. Some of the commonest kinds of agents for whose services C. is usually paid are factors and brokers. A factor is an agent employed by merchants to buy or sell goods or to discount or otherwise negotiate bills of exchange, bills of lading, etc. A factor employed to sell is customarily entrusted with the goods of his principal, and may or may not sell in his own name. A broker is also an agent employed to dispose of goods or property, but differs from a factor in that he is not usually put into possession of his principal's goods; but he may buy or sell in his own name without disclosing the identity of his principal. A distinction should be drawn between factors' and brokers' agreements on the one hand and C. agencies on the other. A C. agency is not an agency in the true sense of that word. It exists where a C. agent or merchant supplies goods to a foreign merchant, or undertakes to buy or sell goods for another on the best terms he can secure for the other party. It is true he gets not only the price from the other party, but also his C.; but the transaction differs from an ordinary contract of sale in that the C. agent sells to the other at the lowest price and looks to the C. for his profit. A broker differs from a C. agent in that he is no more than a medium for establishing privity of contract between his principal and a buyer or seller of goods. A stockbroker furnishes an illustration of an agent whose right to C. or, as it is termed, brokerage is usually implied in the agreement to buy or sell stock, being generally reckoned at one-eighth per cent of the amount of the stock bought or sold at the market price on the date of the transaction. Since the Gaming Act, 1892, an agent employed to make bets for another is not entitled to recover any C. that may have been promised him. Such agents may style themselves C. or turf agents, but they are not legally recognised agents.

Commission, Military, in its most general sense, is the document by virtue of which an officer is authorised to perform

military duty for the service of the State. The royal authorisation to the feudal barons in Norman times presents but few features in common with the grant to-day of a C. in the army. In the Norman period the regular mode in England of assembling an army, either to resist an invading enemy or to accompany the king on a foreign expedition, was by sending a royal command to the chief barons and spiritual lords, that they should meet at a given time and place with their due proportion of men, horses, etc. properly equipped, according to the tenure by which they held their landed estates. These *tenants in capite* appear to have appointed by their own authority all their subordinate officers. But C.s were occasionally granted by the king authorising individuals to raise men for particular service. *Commissions of Array*, as they were called, were also issued by the king of England, probably from the time of Alfred, for the purpose of mustering the inhab. of the shires and training them in military discipline; and in the reign of Edward III the Parliament enacted that no person trained under these C.s should be compelled to serve out of his own shire except the kingdom were invaded. Of the same nature as these C.s of array was that which in 1572, when the country was threatened with the Sp. invasion, Queen Elizabeth issued to the justices of the peace in different counties. This privilege of granting C.s to the officers of the national militia continued to be exercised by the lord-lieutenants of cos. until 1872, when the militia became more closely connected with the regular army. Prior to 1871 C.s were obtained by purchase, except in the artillery and engineers, where they were always conferred without purchase. To a certain extent this was the case with C.s granted to officers of the line—those cadets who had completed a course of military education at Sandhurst being so appointed. In other cases the price of an ensigncy or C. was regulated by authority, varying from £450 for a first C. in an infantry regiment to £7250 for the C. of a lieutenant-colonel in the Life Guards. In proceeding to higher grades, an officer paid the difference between the price of the grade which he left and of that which he entered. But the system of purchase was abolished by royal warrant in 1871 in favour of the present system of entrance into the army by examination, with promotion to higher grades depending on examination in military subjects (as laid down in the Appendices to the Queen's Regulations) and (though to a lesser extent than before the First World War) on seniority. By far the greater number of C.s are given as the result of success in open competitive examinations. First appointments as sub-lieutenants are, however, also granted to non-commissioned officers with a special recommendation, univ. students who have passed certain qualifying examinations, and to 'Queen's' cadets. A number of cadetships for Sandhurst are given annually to young soldiers from the

ranks who show qualities of leadership. C.s now entail previous service in the ranks for a period of at least twelve months, followed by entry to Sandhurst. At Sandhurst the cadet is still in the ranks until he has passed out. The commissioned officers of a battalion of infantry are as follows: Field-officers—lieutenant-colonel and major. Regimental officers—capt. and lieutenant. Staff-officers—chaplain, adjutant, quartermaster. In the navy the various C.s are a sort of warrant signed by the Lords Commissioners of the Admiralty; but the documents are called C.s, and are signed in the name of the king or queen. Under the Cardwell (see CARDWELL, EDWARD, VISCOUNT) reforms civil servants were granted C.s in certain military depts, e.g. purveyors of the Military Store Dept, and others of a like nature. In course of time these officers passed through the stages of relative rank, honorary rank, and quasi-military ranks such as surgeon-capt. The rank of quartermaster and honorary lieutenant (capt. or maj.) survived until 1918, when the honorary was dropped. An innovation took place in 1927 as regards C.s by the issue of a C. in standardised form for all officers of all branches of the service (with a few exceptions). The forms of C. are three in number: the first gives the sovereign's authority to the holder 'in such manner and on such occasions as may be prescribed by Us to exercise and well discipline in arms both the inferior officers and men serving' under the holder; the second refers to chaplains and exhorts the holder 'carefully and diligently to discharge his duty as an officer of the Royal Army Chaplains' Department'; and the third 'gives and grants' the holder 'full power and authority to have, hold, and enjoy' his said honorary rank. The Queen's Regulations prescribe when the command given by a first C. is exercisable and over what bodies. See also RANK.

Commission, Permanent and Special. C.s are occasionally set up for special purposes which may ultimately necessitate permanent session; as in the cases of the Charity C., 1853, the Civil Service C., 1855, and the Railway and Canal C., 1873. The C.s of this nature which are at present in existence include the Charity C., constituted under an Act of 1853 for the better administration of charitable trusts in England and Wales; Civil Service C.; Brit. Transport C., estab. under the Transport Act, 1947, for the general control of the nation's rail, road, and other transport services; Boundary C.s set up under the 1944 Act to review parl. constituencies (see ELECTORATE); Monopolies C., reconstituted in 1956 from the Monopolies and Restrictive Trade Practices C. appointed in 1948 to investigate questions of trade practices; National Parks C.; Crown Lands C.; Agric. Lands C.; Prison C.; and C.s to review co. and co. bor. boundaries in relation to local gov. reform; Development C., appointed under the Development and Road Improvement Fund Acts 1909–10, for the development of agriculture and rural industries, re-

clamation and drainage of land, harbours, and fisheries; Royal Fine Art C., appointed in 1924 (and extended by royal warrant of 1933) to inquire into such questions of public amenity or of artistic importance as may be referred to them by any state dept; Forestry C., appointed under the Forestry Acts 1919–45 and charged with the general duty of promoting the interests of forestry; Historical MSS. C., authorised under a C. issued in 1869 and renewed in 1919, to inquire into the location of MSS. of general public interest with a view to their pub.; standing C. on Museums and Galleries appointed in 1931 to advise generally on questions relevant to the development of the national institutions as a whole; Royal C., for the exhibition of 1851, which promotes scientific and artistic education through funds derived from its Kensington estate purchased with surplus moneys of the exhibition of 1851; Tithe Redemption C., constituted by an Act of 1936; Imperial War Graves C. (see GRAVES, SOLDIERS); War Damage C., appointed in 1941 to administer the War Damage Acts 1941–3; War Works C., appointed to adjudicate on disputes arising out of the Requisitioned Land and War Works Act of June 1945; and all Wheat C. (see under AGRICULTURE). All the foregoing are, in effect, gov. depts of a permanent or quasi-permanent character. Other C.s, again, may be set up to meet an exceptional but temporary state of affairs. Judicial C.s, too, have been appointed for unusual cases where the ordinary legal procedure has been inadequate, and similarly under the Tribunals of Inquiry (Evidence) Act, 1921, tribunals were appointed under a high court judge to ascertain the facts in the wreck of H.M.S. *Thetis*; in the case of alleged disclosure of budget secrets by Mr J. H. Thomas (q.v.) in 1936; and in 1949 under Mr Justice Lynskey to inquire into the rumours of corrupt conduct of public servants.

Commission, Royal. A R. C. is a body appointed to gain information about the operation of existing laws, as a preliminary to their amendment, or on various matters social, educational, or otherwise, and to report to the gov. by what method it is considered the best change could be achieved. A R. C. is constituted by the sovereign, on the recommendation of the Prime Minister, by a royal warrant submitted and countersigned by the home secretary. The particular objects of the inquiry, and the limits within which it must work, are expressly set out in the warrant or terms of reference. Members are selected by the depts most closely concerned with the particular legislation or topic to be investigated, and their record of service and knowledge of the subject under examination are the usual bases for selection. They are normally drawn from outside the ranks of the Civil Service. Sittings and duration of a R. C. are independent of Parliament. Commissioners are not paid for their services, although compensation may be allowed for time and labour in cases where a high degree of professional skill is necessary.

Parliament provides annually for the expenses of R. C.s. When an inquiry is completed the C. signs and presents its report to the Crown. If the commissioners are not unanimous, those in the minority may record their dissent, expressing their personal views in separately signed memoranda, as, for example, in the case of the minority report of the R. C. on the B.B.C. A R. C. has no power to compel disclosure of documents, nor even to administer an oath or compel persons to give evidence. There is no settled practice as to whether, when counsel appear before a R. C., they are entitled to cross-examine such witnesses as do volunteer to give evidence. The procedure adopted before the Evicted Tenants (Ireland) C. in 1892 was to allow questions to be put only through the commissioners themselves; and in the Featherstone Riots inquiry in 1893, Lord Justice Bowen, who presided, followed the same procedure. Instances of R. C.s may be furnished to almost any number, but post-war examples which may be mentioned are that on pop. (1948), which considered the declining birthrate with the object of advising on long-term policy; that on capital punishment (1949-53), whose recommendations were the basis of a revision of the law of murder in 1957; that on the press (1947), which led to the voluntary estab. of the Press Council; that on the B.B.C. (1949) which paved the way for commercial television in Britain; and the C.s on equal pay for men and women (1946); Civil Service pay (1955); betting and lotteries legislation (1951); mental health (1957) (with proposals affecting legislation going back more than 50 years); marriage and divorce; and the taxation of income and profits (1953-4), whose recommendations influenced some aspects of budget policy in 1957, and will probably be incorporated in subsequent instruments of financial policy; and on the problems of Greater London and Middx gov. (1957).

Commission, Secret. With the object of preventing the bribery of agents, employees, or servants of any kind, especially by the payment of money by way of commission, without the knowledge of the agent's or employee's principal or employer, the legislature in 1906 passed the Prevention of Corruption Act, which punishes as a misdemeanour with imprisonment for a term not exceeding 2 years with or without hard labour; or with a fine of £500, or both; or *summarily*, with 4 months' imprisonment or a fine of £50, or both: (1) the corrupt acceptance or obtaining by an agent either for himself or for any other person, e.g. his wife or child, any gift or valuable consideration of any kind as an inducement or reward for doing or forbearing to do any act in relation to his principal's affairs or business; and (2) the corrupt giving or agreeing to give anything to an agent as an inducement to act in such a way. 'Agent' includes employees of all kinds. The passing of the Act was generally regarded as a necessity in view of the ever-increasing corruptibility of persons in

large business houses entrusted with the power to contract for the supply or purchase of considerable quantities of goods, and of various other persons, such as the servants of local authorities, who could not be reached by the criminal law as it stood prior to 1906. The gist of the offence is the paying or receiving *corruptly*, it being no offence in itself either to reward an agent or for an agent to accept a reward. Prosecutions under the Act may only be instituted by leave of the attorney-general.

Commissionaires, Corps of. This useful body was founded in 1859 by Capt. Sir Edward Walter, K.C.B. At its inception it was composed exclusively of a few wounded soldiers, the founder's idea being to make the association a means of obtaining some form of employment for discharged warrant and non-commissioned officers of good character. The corps soon developed into a large institution, which comprises pensioned soldiers, sailors, and airmen. There are branch institutions of the corps in Birmingham, Bristol, Leeds, Liverpool, Manchester, and Newcastle-on-Tyne; Edinburgh and Glasgow; and Belfast. The headquarters are at Exchange Court, 419A Strand, London. The men wear a distinctive uniform, and are generally engaged in light duties of a temporary or permanent character.

Commissioner of Police. There are 2 C.s of P. in England—one for the Metropolis and one for the City of London. The C. of P. for the Metropolis is assisted by 5 assistant commissioners (one of whom has the status of a deputy commissioner), 10 commanders, and 8 deputy commanders. The City of London has a separate police estab. under the C. of P. for the City of London, who has an assistant commissioner to help him.

Commissioners, Church, *see* CHURCH COMMISSIONERS.

Commissioners, Lords, *see* ASSENT, ROYAL.

Commissioners, Naval, *see* ADMIRALTY.

Committal, warrant or order of a court or justice of the peace directing a sheriff, bailiff, or constable to take a named person to the common jail, whether on remand or to await trial. If the arrested person is already in jail, the C. directs the governor to detain the person named for a specified period, and either to produce him or discharge him on the expiration of such period. Apprehension without a warrant is not C. in the proper sense. The Habeas Corpus Act, 1679, provided that a jailer was not justified in receiving a prisoner unless the C. was in writing. A C. must state the offence for which the prisoner is detained.

Committee of Imperial Defence originated in 1890 as a select combination of civil and professional advisers on naval and military matters, formed with the object of securing a greater degree of efficiency of preparation for political contingencies and for joint action in time of war. At its inception it was a naval and military council whose prin. function was to consider the estimates with a view to determining the relative importance of the

respective demands of the two services. During the First World War it was regularly presided over by the Prime Minister, while the members included the war secretary, the first lord of the Admiralty, the head of the Army General Staff, the First Sea Lord, and heads of the Army and Navy Intelligence Depts. The C. of I. D. was subsequently concerned primarily with questions of Imperial defence and only secondarily with the estimates. The Prime Minister continued to be the chairman and the secretaries of state of the service depts, the dominions, Colonial and Foreign Offices, and other interested ministers were members. Under an arrangement made in 1936 to secure a higher degree of co-ordination between the three fighting services a minister for the co-ordination of defence was appointed to act as deputy chairman and to devote his whole time to the duties. The overseas dominions made provision for the defence of their own areas, but the general strategical defence of the empire was undertaken by the Imperial gov., through the C. of I. D. which co-ordinated the work of the sea, land, and air forces. One of the most important sub-committees was that of the chiefs of staff of each of the fighting services, whose function was to draw up plans for defence to be submitted to the main committee and for the execution of the accepted policy of the committee. (This sub-committee, of course, continues to exist, but now reports to the minister of defence.) The C. of I. D. was ancillary in its functions to the Cabinet, being in the main advisory and informative. The plenary sittings of the committee took place some six or seven times a year. Ordinarily the committee conducted its business through permanent sub-committees. The C. of I. D. was replaced by the Defence Committee in 1946 (n.v.). See also DEFENCE, MINISTRY OF.

Committee of Public Safety (*Comité du Salut Public*), body which was co-opted by the members of the Fr. convention in 1793. The powers entrusted to it were at first merely those of supervising the actions of the executive, but by degrees it usurped all the powers of that body. Local committees were subsequently instituted in all the coms. to try suspected persons, and any conception of impartial justice was thenceforth non-existent in France. Robespierre was the leader of the *comité* till his fall in 1794; in Oct. of that year a new constitution introduced a directorial gov.

Committees, Parliamentary. In the endeavour to cope with the ever increasing vol. of work which its expanding powers have brought in their train, Parliament has devised and adapted a system of C. to which it delegates limited authority. These range in size from the committee of the whole House to the select committee of 5 members appointed for a particular purpose. A committee of the whole House, as its name declares, is the House itself, presided over by a chairman instead of the Speaker, and working under rather less rigid rules, e.g. a member may speak

more than once in any question. One or 2 of the major Bills of the session are referred to a committee of the whole House for their committee stage, but the extent to which this can be done is limited by the claims on its time of financial business. The House of Lords, with no such restrictions on it, takes almost all public Bills in the whole House.

Committees of Supply, and Ways and Means. Through these C. the Commons exercise their authority over finance. These 2 C. are appointed at the beginning of every session, and their origin in the Sovereign's demand for supply is indicated in the resolutions moved to establish them: for Supply, 'to consider of the supply to be granted' to the Crown; and for Ways and Means, 'to consider of the ways and means for raising the supply to be granted.' The function of the former is to vote grants to meet public expenditure, and it does this on the estimates presented by the sev. Ministries, in resolutions subsequently confirmed by the House when reported to it, and finally authorised by an Act. When the main estimates are first brought up—naval, military, air, and civil—a special motion to move the Speaker out of the Chair keeps alive and effective the historical doctrine of redress of grievances before the grant of supply, and gives back-bench members the opportunity (for which they ballot) to initiate debates on matters related to the estimates. It is also the custom on these occasions for the Minister responsible to present a substantial review, past and prospective, of the work of his dept. The committee of Ways and Means finds the money for the required supply by the imposition of taxation. The resolutions which give immediate authority to the taxation changes proposed by the Chancellor of the Exchequer in his Budget speech, and exceptionally at other times, are passed in this committee, and reported to the House, after which they are included in the Finance Bill. Bills originating in resolutions of the committee are protected from alteration or delay in the House of Lords.

Standing Committees. All Bills other than money Bills are referred to standing C. after second reading unless the House orders otherwise, and each session standing C. are appointed as necessary to consider them. They consist of not less than 20 nor more than 50 members, nominated in direct proportion to the Gov. and Opposition strengths in the House. A standing committee is thus a miniature House, and it follows in general the rules and procedure of the House in committee, except that in divisions the votes are taken by a roll call of members. C. may sit on any day on which the House is sitting. If a division is called in the House while the committee is in progress the chairman suspends the sitting so that members may vote in the House. One of the standing C. is appointed for the exclusive consideration of Bills and estimates relating to Scotland, and includes all members for Scottish constituencies plus 10 or 15 others. Another

is reserved for Bills introduced by private members. A standing committee dealing with a Bill relating exclusively to Wales and Monmouth must have in its membership all M.P.s for Welsh constituencies.

Select Committees are appointed by each House to consider particular matters or Bills. They have not more than 15 members, and the scope of their activities is defined by the order of reference in which they are set up. They are given power to send for persons, papers, and records, and may take evidence and hear counsel on behalf of parties. A select committee can only extend its inquiries by resolution of the House, which similarly may restrict it to the investigation of specific points. *Joint committees* are sometimes appointed, at the instance of either House, to save time or for other reasons of convenience. They consist of an equal number of members from both Houses, and exercise powers like those of select C. Some select C. appointed every session deal with matters of procedure or domestic matters. The most important of those regularly appointed are the Committee of Privileges (*see* PRIVILEGE), the Estimates Committee, and the Public Accounts Committee. The Estimates committee examines details of expenditure, and has authority to report on what economies might be effected consistent with policy and to suggest the form in which estimates should be presented to the House. It has long had power to form its own sub-committees, and since the Second World War has regularly used a system of investigating sub-committees. The Committee on Public Accounts has 15 members who seek to make sure that grants authorised have been applied to the objects Parliament intended, and call attention to cases in which expenditure has been incurred in excess of the authorised grant. The pub. of its reports, coupled with the reports of the Comptroller and Auditor General on which it acts, constitute an effective check on the actions of the spending depts. *See* PARLIAMENT.

Commodore, in the R.N., a temporary rank between that of an adm. and that of a capt. A C. is usually appointed for a squadron of three or more ships detached from the main body on special service. There are two classes of C.s, of which the first hoists his pennant, white with a red cross, at the main, and holds the temporary rank of a rear-adm. A C. of the second class hoists his pennant at the fore, and has no capt. under him in the ship. A C. may not hoist his pennant in the presence of an adm. without permission. The title is often given by courtesy to the senior capt. of a squadron of sev. ships. In the U.S. Navy the title was purely a courtesy one before 1862, applied to capt. who commanded a squadron. In 1862 it was made a permanent rank equal to that of brig.-gen. in the army, but was abolished in 1899. The title belongs also to the president of a yacht club and to the senior capt. of a fleet of merchant vessels. The equivalent rank in the R.A.F. is Air C.

Commodus, Lucius Aelius Aurelius,

known also as Marcus Antoninus, Rom. emperor 180-92; b. at Lanuvium AD 161, the son of Marcus Aurelius (q.v.), whom he succeeded in 180. Three years after his accession an attempt was made upon his life, and this let loose the cruelty and extravagance of a disordered brain. Thousands were put to death on the occasions of this and other abortive conspiracies; the treasury was quickly exhausted by the emperor's wild expenditure; and C. descended so far from the dignity of his rank as to fight with beasts in the arena, claiming divine honours as Hercules. Eventually, in 192, the prefect of the praetorian guard and C.'s concubine, Marcia, learned that they were secretly doomed to death, and procured C.'s murder by poison and strangulation.

Common, Right of, right of taking a profit in the land of another in common with others. It may either be such a right as is enjoyed in common with others to the exclusion of the owner of the land, or it may not exclude the owner of the land. The commoner has no interest or estate in the soil of the land on which he has a R. of C. The profits which may be the subjects of common right are the natural produce of land or water, such as grass and herbage, turf, wood, and fish. Hence the four species of 'commonable' rights are called common of *pasture*, the right to pasture one's cattle on a particular piece of land; common of *turbary*, the right to cut turves; common of *piscary*, the right to take fish from a particular piece of water; and common of *estovers*, the right to take wood for fuel, or for agric. implements. Where a person enjoys a R. of C. over land by reason of his title to other land, the common is called a common *appendant*, e.g. freeholders of a manor may have the right to pasture a certain number of beasts on the manorial waste lands. A R. of C. is said to be *appurtenant* when claimed (a) by copyholders; (b) by freeholders of a manor when they claim independently of their freehold interests; (c) by freeholders not of a manor. Copyholders may claim by special custom, while freeholders' rights may depend upon grant or prescription (i.e. title by user). There are various ways of extinguishing R.s of C. otherwise than by buying the commoner out, e.g. the enfranchisement of copyhold to which a R. of C. is annexed extinguishes the right. The most usual mode of extinguishing R.s of C. in modern times is by inclosure under Act of Parliament.

Common, Tenancy in. Tenants in common are they who own lands or tenements, whether by a freehold or a leasehold title, in common as distinct from joint ownership. The characteristic features of joint ownership are that each owner has an equal aliquot share of benefit in the undivided whole; and that, assuming no proceedings for severance, the whole ultimately goes to the survivor. In T. in C. each is the owner of an undivided share in the whole, the quantum of his proportionate part depending on the terms of the grant or devise. It is solely the fact that the tenants are all interested in the possession

of the same property that constitutes them tenants in common; and each one of the tenants in common may derive title from a different instrument, whereas joint tenants derive one and the same title from one and the same instrument. There may be tenants in common of other things besides land, as, e.g. of £5000 consols, or a racehorse. The undivided shares of tenants in common no less than the quantity of their interest or estate may be equal or unequal, e.g. A may have the freehold inheritance of two-thirds of a particular park, while B may have only a life estate in the remaining one-third. But so long as B's lesser interest exists, A and B are tenants in common. For all the purposes of sale, disposition by will, or transmission of intestacy, the undivided shares of tenants in common are like separate property. Enjoyment must be in common if possible; if not the tenants must come to some agreement about the mode of enjoyment, and if they cannot agree they must sell the thing and divide the proceeds in the proper proportions. Equity (q.v.) is said to lean against joint tenancies, and the courts endeavour to construe all instruments in such a way as to create tenancies in common rather than joint tenancies. A T. in C. ceases when the ownership of the sev. shares subsists in a single individual; it can also be destroyed by means of a partition suit in equity, unless, indeed, the thing be indivisible, when a sale must be effected.

Common Council of London, see CORPORATION OF LONDON.

Common Field System, see LAND; OPEN FIELD SYSTEM.

Common Form. In the great majority of causes of action the material circumstances are such that judgment can generally be entered in C. F., i.e. in accordance with the long-estab. practice of the courts. In such cases nothing more is required than to fill in the form of the judgment the names of the parties, the dates, the amount of the damages, etc. From the simplicity of the issues in most common law actions, the C. F.s of judgment are usually far shorter than in the case of judgments, orders, and decrees (q.v.) in equity (q.v.) suits. Nevertheless the usage of the Chancery courts has evolved an equally stereotyped set of precedents for use in every conceivable class of case. The term C. F. is not, however, restricted to a form of judgment, but may be regarded as synonymous with precedents in the sense in which that word is used to denote any legal document whatever drafted in accordance with common practice.

Common Good, in Scots law, denotes all the property of a burgh (q.v.) held by the corporation for the general good of the community. C. G. may be either alienable for the debts of the burgh, or inalienable. The lands, mills, and fishings of a burgh which are generally leased for periods customary in the dist., and houses, which are ordinarily let for a year, are alienable. Public lands and buildings, e.g. churches, tn halls, market places, and common greens, and other property

dedicated by grant, Act of Parliament, or otherwise to the special use of the burgh are inalienable. Inquiries have been instituted from time to time ever since 1662 into the mismanagement and maladministration of C. G., the object of the anct grant of which was to enable the burghs to meet the Crown burdens and to discharge their local and municipal duties. These inquiries were productive of but little result, but in 1822 Sir Wm Rae's Act was passed to regularise the administration of the affairs of burghs royal, and under the Town Councils Act, 1900, the local body must make out a yearly account of the C. G. and the revenue arising therefrom.

Common Law, a term of varying import, the different senses or rather shades of meaning of which are to be gathered by contrast with a number of opposed terms. Broadly speaking, the C. L. of England is the universal law of the realm, the fundamental principles of which, based on general customs, have existed from time immemorial, while their subsequent development to meet every new combination of circumstances has been the peculiar province of judicial interpretation acting avowedly on estab. precedent. In this broader sense C. L., as opposed to *lex scripta*, the written or statute law, is styled *lex non scripta*, or the unwritten law of the kingdom. Blackstone includes in the *lex non scripta* not only *general customs*, but also the particular customs of certain parts of the kingdom and such particular laws as are by custom observed only in certain courts and jurisdictions, and explains the description *non scripta* on the ground that the original institution and authority of such parts of our law were not set down in writing, as Acts of Parliament were, but received their binding force by long and immemorial usage and by their universal reception throughout the kingdom. In thus adhering to the classic distinction, Blackstone points out that those parts of the C. L. which he included in the *leges non scriptae* had long since lost their purely oral character, and were to be found in the records of our courts, in books of reports, and in treatises by writers of estab. repute. He accordingly identifies C. L. in its stricter significance with one class only of the 'unwritten' laws, viz. *general customs*, which he describes as the laws by which proceedings in the ordinary courts of justice are directed, e.g. that the eldest son alone is heir to his ancestor; that a deed is of no validity until delivered. *Particular customs*, as opposed to general, affect only the inhab. of particular dists., e.g. the right of the youngest son to inherit by custom of *borough-English* (now abolished). The third branch, *particular laws*, connotes the civil or Rom. municipal law, and canon law or Rom. eccles. law compiled from the opinions of Lat. fathers, the decrees of general councils, and papal bulls, which systems have no authority in England other than that they may have received by immemorial usage in certain particular cases. In its narrower or contrasted sense C. L., or general

custom, crystallised by judicial decisions into positive law, is further and pre-eminently opposed to equity (q.v.), or that body of rules which savours of the *ius naturale* of Rom. law, and was originally formulated by the chancellor acting as the keeper of the king's conscience, and developed by a long line of chancery judges, for the purpose of mitigating the rigour, formalism, and technicality of the C. L. For centuries equity existed side by side with the C. L. as a body of opposed rules gradually growing as technical in its own way as the C. L., until in the year 1873 the Judicature Act abolished the distinction by enacting that the rules of equity should prevail. But though nominally equity and C. L. are fused, practically the distinction is retained by reason of the fact that certain subjects, e.g. trusts, the interpretation of wills, etc., were assigned to the chancery div. of the high court, and, further, from the fact that the queen's bench or C. L. courts have provided no machinery for carrying out equitable judgments.

Common Market, see EUROPEAN COMMON MARKET.

Common Pleas, Court of, one of the old common law (q.v.) courts; before 1881 it existed as a superior court of record, having jurisdiction over England and Wales in all *common pleas*, i.e. civil suits between subjects. Like the present queen's bench div. and the old court of exchequer, it was an emanation of the *Curia Regis*, or committee of the *Commune Concilium* or Great Council of the Realm of Norman times. The term *common pleas* was used in contradistinction to *pleas of the Crown* or criminal causes. By Magna Charta, Article 17, it was provided that the court should be held in a fixed place instead of following the king, an enactment which led to the estab. of the C. of C. P. at Westminster Hall. By the end of the 13th cent. it had acquired, like the other common law courts, a separate staff of judges, distinct from the permanent members of the *Curia Regis*. The number of its judges varied considerably from time to time, but at the period prior to its abolition it was composed of 5 judges, 1 of whom was chief justice and the other 4 puisne justices. Before the passing of the Real Property Limitation Act, 1833, which abolished all *real* and *mixed* actions except that of *ejectment*, it had exclusive jurisdiction in all *real* actions, or actions concerning the freehold title of lands. After 1833 this jurisdiction was restricted to actions of *dower* and *quare impedit*, i.e. actions by a patron against a bishop for refusing to admit and institute to a vacant benefice the clerk nominated by the patron. In *mixed* actions, i.e. those in which a claim for damages was made along with a claim for the specific recovery of some tenement, and in *personal* actions—that is, actions on contract and tort, or civil injury—the C. of C. P. and the 2 other common law courts of king's bench and exchequer exercised concurrent jurisdiction. It was also constituted a court of appeal from the decisions of revising barristers on disputed

franchise claims, a function now delegated to the divisional court. By an Act passed in 1831 it was provided that the judgments of the C. of C. P. could only be reversed by the judges of the king's bench court and the court of exchequer sitting as a court of error in the exchequer chamber, the final appeal being by *writ of error* returnable to the House of Lords. By the Judicature Act, 1873, the C. of C. P. was merged in the C. P. div. of the high court of justice, but it was finally transferred to the queen's bench div. by an order in council issued in 1881.

Common Prayer, Book of, see PRAYER, BOOK OF COMMON.

Common Room, apartment in a monastery, similar to the C. R. of colleges where dons take their wine after hall. A fire was constantly kept burning for the use of monks, and a master monk presided.

Common School, see EDUCATION, U.S.A.

Common Sense, *Philosophy of*, bases all axioms and reasoning on certain fundamental beliefs. Among these conceptions may be named the universality of causality, and the belief in the reality of the material universe apart from the mind of the person perceiving it. These conceptions are all recognised as true by the common sense of mankind. The school is chiefly represented by Thomas Reid and the Scottish school. See also HERKLEY, GEORGE. See J. McCosh, *Scottish Philosophy from Hutcheson to Hamilton*, 1875; A. Seth, *Scottish Moral Philosophy (Philosophical Review, vii)*, 1898.

Common Serjeant, judicial officer of the city of London whose functions are (1) to sit at the Central Criminal Court (q.v.) to aid the recorder in the disposal of criminal cases; (2) to act as a judge of the mayor's court of London for the trial of civil causes; (3) to act as legal adviser or law officer to the city corporation, and to act as counsel in court for the corporation if called upon; and (4) to perform certain duties at elections of the lord mayor, sheriffs, and other corporate officers. The C. S. is next in rank to the recorder. Before 1888 he was elected by the Court of Common Council; since then the appointment has been vested in the Crown. The C. S., who must be a duly qualified barrister, is not disqualified from a seat in Parliament. The salary of the C. S. is at present £3000 a year.

Common Time, name applied to music with two or four beats in a bar. It is especially applied to 4-4 time, four crotchets in a bar, as this time is the most common.

Commoner, term of varying import denoting primarily any person under the rank of a peer. It also means a member of the House of Commons; one who has a title to a right of common (see COMMON, RIGHT OF); and, at Oxford or Cambridge, a student of the second rank, i.e. one who is neither a scholar nor an exhibitor of his college.

Commons, House of, see HOUSE OF COMMONS.

Commons and Enclosures, see OPEN SPACES AND COMMONS.

Commonwealth, a form of gov. without a

monarchy. Particularly applied to Eng. hist. between the death of Charles I and the accession of Charles II, from 1649 to 1680. Also the official designation in the U.S.A. for the states of Massachusetts, Pennsylvania, Virginia, and Kentucky. C. has replaced Empire in relation to the self-governing Brit. dominions. The modern description, Brit. C. and Empire, connotes the fact that the Brit. C. is partly centrally controlled (i.e. the colonial dependencies proper) and partly a C. of individually sovereign states (i.e. the sev. dominions). The term finds its concrete expression and authority in a report by a committee on inter-imperial relations, presided over by Lord Balfour, which was unanimously adopted by the imperial conference of 1926. This report, defining the relationship between Great Britain and the dominions, said: 'They are autonomous communities within the British Empire, equal in status, in no way subordinate one to another in any aspect of their external or domestic affairs, though united by a common allegiance to the Crown, and freely associated as members of the British Commonwealth of Nations,' and this definition was subsequently given legislative sanction in the Statute of Westminster (1931). See further **BRITISH COMMONWEALTH AND EMPIRE; DOMINION STATUS.**

Commonwealth and Empire Settlement Acts, 1922-57. The Empire Settlement Act of 1922 formed the basis of Brit. policy of state-aided empire settlement until the gradual suspension of the Gov. schemes after the economic depression 1930-2. It empowered the gov. to co-operate in agreed schemes for assisting the emigration of suitable persons from the U.K. to the dominions. Subsequent Acts, i.e. the Empire Settlement Act, 1937, the Empire Settlement Act, 1952, and the Commonwealth Settlement Act, 1957, have considerably modified and expanded the basic principles underlying the original act. See further under **EMIGRATION**; and for the individual immigration policies of the various dominions, see under the dominion concerned.

Commonwealth Institute, until 1958 called the **Imperial Institute**, founded in 1887 on the initiative of King Edward VII (then Prince of Wales) to commemorate the golden jubilee of Queen Victoria. The cost was met by contributions from all over the Empire. The buildings, on a site in S. Kensington, London, consisted of a main block with an overall frontage of 750 ft to Imperial Institute Road, and an extensive range of exhibition galleries at the back. The architect was T. E. Colcutt, and the Institute building, completed in 1893, was opened by Queen Victoria in May of that year. The main building had 3 towers, the central or Queen's Tower, which contains a peal of 10 bells, being nearly 300 ft high. The bell-chamber, 200 ft above pavement level, is said to be the highest in the Brit. Is. The Institute acts as a centre for information about the Brit. Commonwealth. It is an independent grant-aided organisation operating under the aegis of the

minister of education. From its foundation until 1902, when by Act of Parliament it was placed under the care of the Board of Trade, the Institute was a private body governed by royal charter. In 1907 management of the Institute passed by agreement to the Colonial Office, and this arrangement was given statutory sanction by an Act of 1916. In 1925 an Act was passed which repealed earlier Acts and transferred the Institute to the control of the Dept of Overseas Trade (Board of Trade). At that time the Institute's functions were partly scientific (the examination of raw materials from the Commonwealth) and partly educational. In 1949 Orders in Council limited the Institute's activities to education and public information, under the general direction of the minister of education. The scientific depts were taken over by the Colonial Office. In 1953 by a further Order in Council the Institute once more became an independent body, although the minister retained his parl. responsibility.

The exhibition galleries, open free every day of the year except Good Friday and Christmas Day, illustrate the life, scenery, and resources of all the countries and territories of the Brit. Commonwealth. A magnificent collection of dioramas (illuminated picture models) is a notable feature. The Institute has a small cinema which shows documentary films, and an art gallery for temporary exhibitions of the work of Commonwealth artists. The Institute's galleries and cinema are excellent media for visual teaching, and they are visited by many thousands of school-children who come in organised parties to receive lessons from the permanent teaching staff. Other educational services include lectures, conferences, visual aids, and pubs. A book-stall offers a large and carefully selected stock of inexpensive maps, wall charts, books, and leaflets about the Commonwealth drawn from official and other reputable sources. The Institute issues an ann. report which is obtainable free on request.

By early in 1958 plans were being developed for the rebuilding of the C. I. on a site at Holland Park, London; of the original Colcutt building it was proposed that the campanile might be retained free-standing on a re-planned site for the enlarged Imperial College (q.v.) of London Univ.

Commonwealth Institute of Entomology, founded in 1913 to encourage and co-ordinate entomological work throughout the Empire in relation both to human and animal diseases and to agriculture. The head office is at the Brit. Museum (Natural Hist.), Cromwell Road, London, S.W. The Institute absorbed the Entomological Research Committee appointed in 1909 with the object of furthering the study of economic entomology particularly in the Brit. Tropical African Colonies and Protectorates. The Institute publishes a quarterly bulletin entitled the *Bulletin of Entomological Research* and a monthly review entitled the *Review of Applied*

Entomology, which summarises all current entomological literature bearing on injurious insects.

Commonwealth Mycological Institute, founded in 1920 and now at Kew, Surrey. It was the outcome of a proposal adopted by the Imperial War Conference in 1918, that a central organisation should be estab. for the encouragement and co-ordination of work throughout the Empire on the disease of plants caused by fungi. Since 1933 the Institute has been under the control of the executive council of the Imperial (later Commonwealth) Agricultural Bureaux. Its work on the diseases of plants caused by fungi is broadly on the same lines as that of the Commonwealth Institute of Entomology (q.v.) in regard to insects. Its primary function is to assist plant pathologists in the Commonwealth by the accumulation and distribution of information on all matters connected with plant diseases and by the identification of specimens.

Commonwealth of Australia, The, came into existence on 1 Jan. 1901, when the five Australian colonies of Great Britain united with Tasmania in a federal state under this name. See AUSTRALIA.

Commonwealth Telecommunications Board, incorporated by Act of Parliament, 1949, to supersede the former C. Communications Council (which in 1944 had itself superseded the Imperial Communications Advisory Committee constituted in 1929). Its object is to co-ordinate the telegraphic services (cable and wireless) connecting the various parts of the Commonwealth, and it is particularly concerned with questions of policy regarding the institution of new services, the discontinuance of existing services, and the distribution of traffic between alternative routes.

Commune, in feudal times in France, meant a body of burgesses in a town which had been granted a charter of incorporation by the king. Subsequently it came to denote any body of persons in a par. or dist. organised for the purposes of local gov., and subordinated to the central authority of the state. The C. is now the unit of local governmental administration in France, and is composed of the citizens, a council elected by the C. itself, and a *maire* appointed by the state.

Commune of Paris, 1871, name given to the municipality proclaimed by the insurrectionist element in Paris on 18 March 1871, while the victorious Ger. Army was encamped on the heights outside the city. Some five months after the proclamation, in Sept. 1870, of the Third Republic, the National Assembly, elected after the capitulation of Paris, succeeded to the functions of the provisional Gov. of National Defence. This Assembly contained a majority of Monarchists, and the knowledge that the Assembly, with its anti-Republican feelings, was about to disband the National Guard kindled disaffection among the revolutionary element in the city, with the result that the latter proclaimed a C. in accordance with the traditions of the C. of the Fr. Revolution. The National Assembly and the

garrison troops then retired to Versailles, whence the latter, reinforced by the liberated Fr. soldiers of the Sedan and Metz armies, returned to conduct a second siege of Paris under the eyes of the silent Ger. Army. The Communards, having burnt the palace of the Tuilleries, the Hôtel de Ville, and some other public buildings of historic interest, were themselves speedily made the victims of the fury of the Fr. regulars. Four days after the burning of the Tuilleries, on 28 May 1871, Paris was taken by storm, some 20,000 to 30,000 men and women having been shot in the streets of the city, the C. was deposed, and a number of its chiefs executed or transported.

There is, however, really but little relationship between the C. of P., 1871, and that of the Fr. Revolution. The latter was the spontaneous expression of the hatred of the Parisian populace for the Fr. aristocracy. The Girondists, having encouraged the revolt against the tyranny of the privileged classes, were utterly unable to destroy the force to which they had given birth, and Paris fell under the Reign of Terror, fomented by the triumvirate of Robespierre, Marat, and Danton. But the C. of 1871 was an insurrection motivated by a desire for local or self-gov. for Paris, and the democratic expression, loose and incoherent though it might be, of dislike for the prevalent centralisation (q.v.) and the growing power of the industrial bourgeois class. The point of contact, however, between the two C.s is that they were essentially the instruments of the mob; but while the earlier Communards based their pretensions on no sounder theories than the doctrine of an original social compact and the moral superiority of the state of nature promulgated by Rousseau, and ended with nothing clearer than a frenzied cry for equality, liberty, and fraternity, the intellectual chiefs of the later C. displayed strong socialistic views which, even if theoretically vague, nevertheless contained in them a clear expression of revolt against economic oppression by the moneyed classes. The Communards of 1871, however, should not be confused with the Marxian Communists of later revolutions, with whom they have no connection. See also P. Lissagaray, *Histoire de la Commune de 1871* (Eng. trans. by E. B. Aveling), 1886; E. Belfort Bax, V. Dave, and W. Morris, *A Short Account of the Commune of Paris, 1886*; and F. Lepelletier, *Histoire de la Commune, 1911*.

Communications, see AIR MAIL; AVIATION, CIVIL; BROADCASTING; CANAL; RAILWAYS; SHIPPING ROUTES; TELEGRAPHY; TELEPHONE, etc., and under *Communications* in the general articles on countries.

Communion (Lat. *communio*, Gk *koinōnia*), participation in the sacrament of the Lord's Supper. Since only those holding the faith of and belonging to the Church were admitted to this rite, the word C. became applied to the fellowship of those united by belief in the tenets and reception of the sacraments of any particular religious body or Church. Hence

we speak of the Rom. C., the Anglican C., and the Lutheran C. C. in both kinds is a theological term signifying that in the celebration of the Lord's Supper communicants receive the sacrament under both the species of bread and wine. This was undoubtedly the general practice of the primitive Church, but in the early Middle Ages the custom of withdrawing the cup from the laity gained ground. The Council of Trent in 1563 ratified this practice in the Rom. Catholic Church.

Communism, in its limited application, means the common management of industry and the sharing of its fruits. There is common management of parks, schools, public pleasure grounds, etc., and practical C. in water which is supplied free to the poorest inhab. As a social theory, C. finds few adherents either in Great Britain or in the U.S.A., but the movement has gathered many adherents since the Second World War in France, Italy, and Yugoslavia, though some allowance must be made for the influence of Russia over countries of E. Europe. Again, the Communists in pre-Nazi Germany polled many votes, but were ultimately disrupted by Hitler (see COMMUNIST PARTIES).

In early times property was often held in common, and in this respect the religious orders have always practised a form of C. Plato's *Republic* and Sir Thomas More's *Utopia* advocate social organisations having many communistic elements. Saint-Simon and Fourier are also generally considered to be Communists, though their systems do not demand absolute equality. New interest was aroused in C. by the estab. of the Soviet system in Russia following the revolution of 1917. The C. of Russia aimed at much more than the socialisation of wealth, for it seized the means of wealth-production. In the deliberate and avowed policy of the leaders of the movement some startling and paradoxical methods were upheld. It was contended that revolution must precede good order, and that a dictatorship was essential in order to procure national equality. The milder Fabian notions of gradual change were openly repudiated and the necessity of tearing down existing systems, at no matter how great an immediate cost, before new ones could be devised, was proclaimed. Russian C., successful at all events in revolution and in the estab. of a dictatorship, proceeded along the 2 definite lines of education and propaganda in order to estab. its future; but even the vigorous prosecution of these methods did not lessen the apparent need for ever-increasing powers of dictatorship. C. in Britain and other countries is a title frequently adopted by politicians for whom the prevailing Socialist teachings are not sufficiently forceful. During the 1919 general election in Great Britain, candidates adopting this description first stood for election in sev. constituencies. But the movement as a whole gained few adherents. Since then it has made little headway, the common opinion being that it is a movement subsidised by Moscow. In the 1945 general election the Communist

party had 21 candidates of whom only 2 were elected. These lost their seats in 1950.

See also BOLSHIEVISM; COMMUNIST PARTIES; COMMUNIST PARTY OF THE SOVIET UNION; ENGELS, F.; MARX, H. K. See J. S. Mill, *Principles of Political Economy*, 1848; K. Marx, *Das Kapital*, 1867-85; S. and B. Webb, *Soviet Communism: a New Civilisation*, 1941. The development of C. from Marx's reflections on the philosophy of Hegel is outlined in R. L. Heilbroner, *The Great Economists*, 1955.

Communist Parties. The Communist Party of Great Britain (C.P.G.B.) was founded in 1920 to propagate the principles of Communism (q.v.), many of its founder members having belonged to Socialist bodies, particularly to the Social-Democratic Federation. It has had little parl. success. Its first member, S. Saklatvala, was elected for Battersea N. in 1924 and sat till 1931. W. Gallacher was elected in 1935 for W. Fife and sat till 1950. P. Piratin was elected in 1945 for Stepney but lost his seat in 1950. The party is affiliated to the Cominform (previously the Third International), whose seat is in Moscow. The Brit. Labour party forms part of the Labour and Socialist International, which is in line of succession of the old Second International, and is supported by most of the democratic parties in Europe, and by some in other continents. Unlike the Third International, which was the creation of the Communists of Soviet Russia, and was dominated by them (as the present-day Cominform still is), the Labour and Socialist International cannot give orders to its affiliated organisations. In Germany the Communist party in the 4 Reichstag elections of 1930-2 polled between 5 and 6 million votes; but after these successes they were gradually overwhelmed by the Nazis; their leader, Thaelmann, was flung into jail, and repressive measures were taken against the party as a whole. Even the notorious Reichstag-building fire of 1933 was laid, though without evidence, at the door of the Communist party. Similarly, in Austria, the Gov. decided to dissolve the Communist party on account of its subversive propaganda. The Communist party played only a minor role in the Sp. revolution, the Sp. Communists affiliated to the Third International comprising a negligible minority; the more influential left-wing party in that country was identified with the *Sindicate Union*, an independent Labour organisation. Late in the Civil war (Mar. 1939) there was a determined Communist revolt in Madrid, but it was crushed by the Republicans in a few days, and attempted uprisings in Valencia, Almeria, and other prov. centres were similarly overcome. In Great Britain in 1933 the Communist party agreed with the Independent Labour party that a 'united front' should be presented by the 2 parties against Capitalism and Fascism. They approached the Labour party and the T.U.C. in the hope of securing their co-operation, but signally

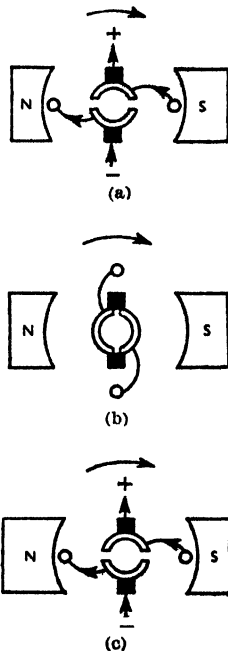
failed. There was a large Communist party in Czechoslovakia up to about 1938, but, with the Ger. threat to the Sudetenland, its influence rapidly waned, and with the Ger. invasion of the whole country it was driven underground. The outbreak of the Second World War saw the rapid decline of the C. P. in most countries whose sympathies were with the cause of the W. democracies, and the policy of Stalin towards the Poles and Finns hardened world opinion against them everywhere, notably in Italy (see also ANTI-COMINTERN PACT). With the end of the Second World War in 1945, however, the C. P. made their influence felt in many countries in Europe, largely owing to the rise in the cost of living (see COMINFORM). Again, the revolt in the Dutch E. Indies was largely organised by Communists (see INDONESIA). But perhaps their most striking advance is in China, where during 1940-9 a successful civil war was waged between their forces and the forces of Chiang Kai-shek (see CHINA). The military suppression of the revolt against the Russian-controlled Communist party in Hungary in 1956 caused widespread dissension and disaffection in C. P. all over Europe. See also COMMUNISM.

Communist Party of the Soviet Union, political party in Russia, which has an absolute monopoly of power. Article 126 of the U.S.S.R. Constitution states that 'the most active and politically conscious citizens in the ranks of the working class, working peasants, and working intelligentsia voluntarily unite in the C. P. of the Soviet Union, which is the vanguard of the working people in their struggle to build communist society and constitutes the core of all organisations of the working people, both public and State.' In fact the party's monopoly of power extends to all spheres of economic life, social relations, political and cultural activities, artistic work, and scientific theory. The only sphere where the party's authority is not claimed is the doctrine and the ritual of the Church. The C.P.S.U. achieved this dominant position gradually between 1917 and 1950 through the seizure of political power, suppression of all other parties and non-Communist organisations, nationalisation of industry and trade, collectivisation of agriculture, elimination of foreign influences, and imposition by decree of specific views, doctrines, and tastes. The party leadership are determined to preserve the monopoly of power and their statements on this point are most emphatic. The internal affairs of the party have had a similar development. It first appeared in 1900 as a private group (see ISKRA) within the Russian Social Democratic Labour Party (q.v.), became 1 of the latter's 2 factions (Bolsheviks) in 1903, and a separate party in 1912 (changing the name to C. P. in 1919 and finally dropping the word Bolsheviks in 1952); factions within the party were proscribed in 1921, and all open oppositional groupings suppressed by 1930. From 1934 to 1953 Stalin exercised unlimited personal dictatorship

inside the party as well as outside. Now the supreme authority is concentrated in the Presidium (former Politburo, q.v.) of the party's Central Committee, and to some extent in the Central Committee itself. See also BOLSHEVISM; LENIN; STALIN. See N. Popov, *Outline History of the Communist Party of the Soviet Union*, 2 vols., N.Y., 1934; J. Towster, *Political Power in the U.S.S.R.*, N.Y., 1948; W. Kolarz, *How Russia is Ruled*, 1953; M. Fainsod, *How Russia is Ruled*, 1953.

Community Foundations, or Trusts, exist in the U.S.A. and Canada for the administration of charitable funds. These funds are the accumulation of grants from private donors, and for the majority of C. F. banks act as trustees. The first C. F. was founded in 1914 under the auspices of the Cleveland Trust Company, and was called the Cleveland Foundation. There were seventy-five C. F. in 1956, each especially concerned with the welfare of the town in which it existed. The largest C. F. were in New York, Cleveland, Boston, Chicago, and Los Angeles. The New York Community Trust was founded in 1923, and distributed \$150,000 in 1955 from a capital of \$26,840,000.

Commutator, a copper cylinder split into segments insulated from one another with mica, placed on the shaft of d.c. machines and a.c. motors. Each armature



coil is connected to a pair of segments, and fixed carbon brushes are placed in contact with the segments. In the fig. the C. is assumed (for brevity) to have 2 segments only; the small circles represent the ends of the coil rotating in the magnetic field as indicated (see ALTERNATING CURRENT). In position (a) the induced e.m.f. is maximum and the top segment is the positive terminal of the coil; as the coil rotates to (b) the e.m.f. decreases to zero; the brush bridges the gap, passing over to the other segment as

and in the S. is the Brianza (q.v.) dist. It is fertile, and produces wine, corn, silk, olives, and fruit. Area 810 sq. m. Pop. 576,000.

2. (anc. Comum) It. city, cap. of the prov. of C., at the SW. end of Lake C., 20 m. N. of Milan (q.v.). It stands in a valley enclosed by hills which are clad with luxuriant gardens and plantations of olives and oranges. It was for long a centre of the Ghibellines (see GUELPHS AND GIBELLINES); it was destroyed by the Milanese in 1127, was rebuilt thirty



By courtesy of the Italian State Tourist Office

COMO, SHOWING THE CATHEDRAL AND PART OF THE LAKE

the e.m.f. reverses. Thus the top brush is again in contact with a positive segment (c). The induced alternating e.m.f. has its negative half-wave 'rectified' (see RECTIFIERS). The C. is the most delicate part of a machine. The carbon brush must fit precisely on the copper surface; any portion or point of defective contact leads to sparking, with consequent further deterioration. The mica insulation must not reach the surface, and the free part of the groove between segments must be kept clean. Any bridging of the gap by carbon, dust, etc. short-circuits the corresponding armature coils.

Comnena, Anna, see ANNA COMNENA.

Comnenus, see ALEXIUS I. COMNENUS.

Como: 1. Prov. of Italy, in W. Lombardy (q.v.). It is in the Alps (q.v.), is bounded in the N. by Switzerland, and has very beautiful scenery. It contains Lake C. and part of Lake Lugano (qq.v.),

years later, and finally yielded to the Visconti (q.v.) in 1335. The town has Roman remains, and the medieval walls still exist. The cathedral (1396-1770), in a blending of Gothic, Renaissance, and baroque styles, is considered one of the finest in Italy. There are other notable ancient churches, and a 13th cent. Palace of Justice in black and white marbles. C. is a celebrated tourist resort, and has an important silk industry. Optical instruments, metal goods, and motor cycles are also manuf. The two Plinys and Volta (qq.v.) were b. here, as were sev. popes and, possibly, Caelius Statius (q.v.). Pop. 72,000.

Como, Lake (It. Lago di Como; anc. Larius Lacus), It. lake, in NW. Lombardy (q.v.), lying at the foot of the Alps. It is formed chiefly by the waters of the R. Adda (q.v.), which enters at the NE. and issues at the SE. extremity of the lake. Its greatest length is 30 m., but 15 m.

from its N. end it divides SE. and SW. into two branches, of which the SE. branch is also called the *Lago di Lecco* (see *Lecco*). Its greatest breadth is $2\frac{1}{2}$ m. and its greatest depth 1378 ft. There are numerous fashionable resorts on its shores, including Bellagio, Cadenabbia, and Cernobbio (qq.v.).

Comorin, Cape, most southerly point of India. It is low and sandy, and not visible from vessels at a distance of more than 16 m. A vil. and temple have been built on rocks, and there are remains of Dutch fortifications.

Comoro Islands, group of is. belonging to France, situated in the Indian Ocean, midway between Madagascar and the African continent. There are 4 chief is., viz. Great C., Anjouan, Mayotte, and Mohéli. Since 1 Jan. 1947 the C. I. have had administration and financial autonomy, and are represented in the National Assembly, the Council of the Republic, and the Assembly of the Fr. Union by 1 deputy each. The is. are of volcanic origin and are extremely mountainous. The largest and most westerly is Great C., about 35 m. long and 12 m. wide. Next in size is Anjouan, 30 m. long and 20 m. at its greatest breadth. Mayotte is 21 m. long, and Mohéli 15 m. long. The Fr. headquarters are at Zandzi a small is. off the coast of Mayotte. The fertile soil produces vanilla, copra, coffee, sisal, and citronella, while turtles are caught abundantly in the neighbourhood and form an article of export. The is. were first visited by Europeans in the 16th cent., and Mayotte was ceded to France in 1841; the others became Fr. in 1886. Brit. forces occupied Mayotte on 2 July 1942. The combined pop. in 1953 was 180,000 (Great C. 90,000; Anjouan 65,000). The people are mostly Muslim.

Compagnie Générale Transatlantique, or **French Line**, most important of the Fr. shipping companies which for over a century has been an essential factor in the economic life of its homeland. It was founded in March 1855 as the *Compagnie Générale Maritime*, but its name was changed in 1861 to the present title. Before the Second World War it ensured France's commerce with the countries bordering the Caribbean and the coast of N. Africa; its ships fetched and transported cargoes from the E. and W. coasts of S. America and the great ports of the Amer. Pacific coast, and it held a leading position on the N. Atlantic, a fine fleet, of which the great *Normandie* was the flagship, maintaining a frequent service between Le Havre, Southampton, and New York. Serious losses were sustained in the Second World War—two-thirds of Fr. Line tonnage was lost, and amongst these losses were many of the major ships of the line. An outstanding postwar reconstruction programme has resulted in remarkable recovery. The present-day fleet of 75 ships totalling more than 500,000 gross tons exceeds the line's tonnage in 1939. The flagship is now the *Liberté* (the world's fourth largest ship); other famous ships of the line include the *Île de France* and *Flandre*

on the New York run and the *Antilles* and *Colombie* serving the W. Indies.

Companies, City (i.e. of the city of London), also known as **Livery Companies**, name given to certain societies or corporate bodies existing in the city of London. These C. began in the Middle Ages, and are a survival of the industrial and municipal system of trade organisations known as guilds (q.v.) or gilds. In the reign of Henry II (1212) the C. of the Goldsmiths and that of the Peppercers, later incorporated with the Grocers', are mentioned, and also 'Gulldhall.' Edward III was a member of the Linen Armourers and Merchant Taylors, a signal instance of royal favour. The name of 'Livery' comes from the distinctive costume or livery that the members of the C. wore. Originally they were genuine corporations of the members of the particular trade, and had important and valuable functions in regulating trade matters, especially as to apprenticeship, good production, etc. Their power gradually fell into the hands of the wealthiest members, and passed away from the trade altogether, and now they have little or no connection with the trade to which their name attaches, except so far as their educational funds are devoted to special or technical education. Many of the C. are possessed of great wealth, and large sums are held in trust for specific charities, etc. The twelve greater C. are here given in order of civic precedence: Mercers', Grocers', Drapers', Fishmongers', Goldsmiths', Skinners', Merchant Taylors', Haberdashers', Salters', Ironmongers', Vintners', and Clothworkers' (qq.v.). These C. had halls of their own in the city; the anc. halls having for the most part suffered in the Great Fire of 1666, the existing halls were fine and comparatively modern, but of thirty-four standing at the beginning of the Second World War only three were undamaged at its end—the Apothecaries', the Ironmongers', and the Vintners'. Many C. possess fine old plate, pictures, and other valuable artistic property. There are sixty-four other C. still in existence, their incomes varying very much. The names of some of them, such as the Liners', the Girdlers', the Fletchers', are interesting survivals of old trades. The lord mayor, sheriffs, city chamberlain, and other corporation officers are elected by the liverymen of the C. C. as freemen of the city, a right that has been left them, though many of their former privileges have been taken away. The C. are ruled by the court of the master and wardens, chosen from the liverymen who are recruited from the third class or freemen of the company. In 1880 a royal commission inquired into the Livery C.s and their finances. The report (1884) contains much information. They are large supporters of charities and educational estab.—Tonbridge School, by the Skinners' Company; St Paul's, by the Mercers'; Merchant Taylors', by that company, being the chief. See W. Herbert, *History of the Twelve Great Livery Companies*, 1837; W. C. Hazlitt, *The Livery Companies of the City of London*, 1892;

G. Unwin, *The Gilds and Companies of London*, 1908; W. Kent, *An Encyclopaedia of London*, 1951.

Company, John, popular nickname for the old E. India C.

Company, subdivision of a battalion. The Brit. infantry battalion is divided into C.s, each of which is commanded by a major or captain. The Army Service Corps is divided in a similar manner into C.s. The C. is itself again divided into platoons, and these are subdivided into sections. In itself the C. is practically self-controlled, keeping its own books and its own arms chest. The Engineers are

which incorporate the main provisions usually found in earlier special Acts creating such public utility C.s; (b) C.s incorporated by Royal Charter, which are now rarely launched, exist for trading activities in certain regions abroad, e.g. Hudson's Bay Company; (c) C.s for trading purposes registered under the Companies Act, 1948, comprise the great majority of C.s. The prin. advantages enjoyed by C.s are the limitation of personal liability of members and the increased commercial efficiency in co-operative effort and outlay of capital. The main provisions regulating Eng. and



THE HALL OF THE MERCERS' COMPANY

This hall and the company's chapel were destroyed by bombing on 10 May 1941.

divided into squadrons. A battery of artillery and a squadron of armour are the equivalents of a C. of infantry. C. of a ship includes the whole of the persons employed on board and paid for specific duties, and therefore excludes troops and passengers.

Company and Company Law. Most commercial activities are carried on by associations of persons either in partnerships which are registered as firms under the Business Names Act, 1916, or as corporations called C.s mostly registered under the Companies Act, 1948. Individual partners have no separate legal identity from that of their firm; a C., however, has a legal entity separate from the members comprising it. Most C.s today are in one of the following categories: (a) C.s formed under a private or special Act of Parliament to undertake some public utility service, e.g. waterworks, docks, or harbours. They are regulated by the Companies Clauses Acts, 1845-69,

Scottish C.s are now consolidated in the Companies Act, 1948. This article considers the prin. topics relating to the management of C.s.

Formation of a company. A C. becomes a legal entity on the issuing of a certificate of incorporation by the registrar of C.s, who is an official of the Board of Trade. Applicants for the registration of a C. must file at the C.'s registry the following documents: (i) a memorandum of association signed by at least 7 persons, each taking at least 1 share in the C. (only 2 persons need sign if the C. is to be a *private C.*); (ii) articles of association; (iii) a statutory declaration that all the statutory requirements for registration have been complied with.

Memorandum of Association. Under the Companies Act, 1948, this must contain the following 5 clauses: (1) the name of the C.; (2) the situation of the registered office; (3) the objects of the C.; (4) liability of members; (5) the amount

of share capital. (1) The name of the C. must be approved by the Board of Trade, which may refuse to register a name which it considers to be undesirable. The word 'limited' must be included at the end of the name, although non-profit-making C.s may, with the licence of the Board of Trade, omit it. The name may be altered by special resolution of the C. and the consent of the Board of Trade. (2) The office clause states whether the registered office of the C. is to be in England or Scotland but does not specify its address, although this must be notified to the registrar of C.s. Any change of address, must be notified within 14 days. (3) The objects clause sets out the powers of the C.; any act not authorised by this clause is *ultra vires* and cannot be ratified by the shareholders. The objects may be altered by special resolution for one of seven purposes specified by section 5 of the Act (e.g. to carry on the C.'s business more economically or efficiently). (4) The liability clause indicates whether the liability of members is limited by their shares or by guarantee. On the winding up of a C. limited by shares, the liability of members is limited to the amount unpaid, if any, of shares held by them. In the winding up of a C. limited by guarantee, the liability of each member is limited to the amount which he has guaranteed to contribute to its assets in such a contingency. (5) The capital clause states the amount of the initial authorised capital and the manner of its division into shares (e.g. £100 divided into 100 ordinary shares of £1 each). A memorandum may only be altered in the circumstances and in the manner permitted by the Act. Under section 23 a C. may, by special resolution, alter any conditions in its memorandum which could lawfully have been contained in its articles, unless the memorandum prohibits such alteration; it may not, however, vary the special rights of any class of members. Dissenting shareholders holding between them 15 per cent of the issued share capital may, within 21 days of the special resolution, apply to the court to cancel the alteration.

Articles of Association. This document constitutes a contract between all the members (shareholders) and the C. It contains the regulations for the internal administration of the C., including such matters as the mode of div. of profits and losses, calls on, transfers, and transmissions of shares, conversion of shares into stock, increase or reduction of capital, borrowing powers, qualifications of directors, meetings, powers of directors, auditing of accounts, and the winding up of the C. A C. limited by shares need not, but usually does, file articles; a C. which does not do so is automatically governed by the model articles specified in Table A of the first schedule to the Act. The articles may amplify the memorandum but must not contain any provision contrary to its tenor; they may be altered by special resolution subject to certain restrictions (e.g. a member may not be compelled to increase his liability to the

C.; the alteration must not be illegal or conflict with the memorandum or constitute a fraud on the minority of members). When registered the articles bind the C. and its members to the same extent as if they had been signed by each member and contained covenants (q.v.) on the part of each member to observe them.

The Promoter. The promoter is the person who is responsible for the C.'s existence as such. The typical promoter starts the scheme of forming the C., negotiates with the vendors (if any), gets together the board of directors, retains brokers, bankers, and solicitors for the C., has the memorandum and articles of association prepared, provides the registration fees, drafts the prospectus, pays for the expense of issuing it, etc.; in a word, undertakes to form a C. with reference to a given project and to set it going and to take the necessary steps to accomplish that purpose. A promoter stands in a fiduciary relation to shareholders and subscribers, and therefore may not make any secret profit out of the flotation, whether he is selling his own property to a syndicate or himself forming a syndicate with other promoters to purchase property for the purpose of reselling it at an enhanced figure to some other syndicate. An intending shareholder should be careful to ascertain what the vendors paid for the property or concern the exploitation of which is to be the substratum of the C., for unless the true purchase price is disclosed, and the profit on resale accruing to the vendors, the shareholder will never know what liabilities the C. is under in regard to its preliminary contracts. For this reason he should beware of the 'waiver' clause in the prospectus which is mainly designed to put him off inquiry. Section 97 of the Act is aimed at making it impossible for promoters to arrange for charges being created before the C. is registered, and thereby avoid the necessity for registration of charges which affect the property of the C. no less than would have been the case if the charges had been created by the C. itself. The promoter or promoters are liable (together with directors and others) to pay compensation to all persons who subscribe for shares or debentures on the faith of the prospectus for the loss or damage such persons may have sustained by reason of any untrue statement in the prospectus. Promoter in this context does not include any person acting in a professional capacity for persons engaged in procuring the formation of the C.

Prospectus. This is a circular issued by the promoter or directors of a C. inviting the public to take up shares. The issue of prospectuses must satisfy certain statutory conditions which are designed to protect the public from the reckless or dishonest representations about C.s for which their capital is solicited. 'Public' means any section of the public including existing shareholders. New issues of shares are often offered to the public by 'issuing houses' (financial concerns specialising in C. issues) to whom the C. allots

the shares for re-issue to subscribers. Although the prospectus may be prepared and issued by the issuing house, it is deemed to be issued by the C. whose shares are offered for sale. Section 38 and the Fourth Schedule to the Act provide that prospectuses (other than those issued to existing share or debenture holders) must disclose certain information and reports. The matters to be disclosed include, *inter alia*, the number of founders', management, or deferred shares (if any), and the nature and extent of the interest of the holders of such shares in the property and profits of the C.; any provisions in the articles concerning the remuneration of, and the number of shares as the qualification of, directors; the names, descriptions, and addresses of directors or proposed directors; the minimum amount which the directors consider must be raised by the issue of shares to provide for the purchase of any property to be purchased wholly or partly out of the proceeds of the issue; any preliminary expenses payable by the C.; any underwriting commission (i.e. commission payable to any person or syndicate undertaking to take the whole or a portion of any offered shares that may not be subscribed for by the public); the working capital; the time of the opening of the subscription lists; the amount payable on application and allotment on each share; particulars of any options to purchase shares and debentures of the C.; the number of shares and debentures issued as fully or partly paid up otherwise than in cash; the names and addresses of the vendors of any property acquired or proposed to be acquired by the C.; the amount paid or payable in cash, shares, or debentures to the vendors; any amount or benefit paid or given within the two preceding years, or intended to be paid or given, to any property, and the consideration for the payment or benefit; details of every material contract (other than contracts in the normal business of the C.); the names and addresses of the auditors (if any) of the C.; full particulars of the interest of each director in the promotion of or in the property proposed to be acquired by the C., and any sums in cash or shares paid to him, or agreed to be paid to him, to induce or qualify him to become a director; the voting rights attached to the sev. classes of shares (where divided into different classes); and the length of time the business of the C. or a business which it proposes to acquire has been carried on (if such business has been carried on for less than 3 years). The prospectus must disclose an auditor's report on certain financial matters relating to the C. and any subsidiaries (e.g. profits and losses, assets and liabilities). Thus a prospective investor will be able to obtain a reasonably accurate impression of the activities and financial strength of the C. Any condition in the prospectus which purports to waive the requirements of Section 38 and the Fourth Schedule to the Act is void, but Section 38 does not apply to shares and debentures previously issued or dealt

in on a prescribed stock exchange. Any untrue statements, whether fraudulent or innocent, will, if material, entitle the persons taking shares on the faith of such representation to rescind the contract. In the case of fraud, damages may also be obtained. A person who has been misled by the non-disclosure of information required by Section 38 to be included in the prospectus may rescind his contract to take the shares, or obtain damages. Criminal liability attaches to any person authorising an untrue statement in a prospectus, unless he proves that the statement was immaterial or that he had reasonable grounds to believe, and did believe, it to be true (Section 44). This section does not extend to experts.

Members. These are persons who sign the memorandum on the incorporation of the C. and others who subsequently acquire shares and are entered on the register of members. Anyone can become a member, but an infant may repudiate his shares on attaining full age. Members must generally pay for their shares unless these are allotted in consideration of services rendered or property sold to the C. Every C. shall keep a register of its members, containing their names and addresses, the amount and numbers of their shares, amount paid for them, the date of entry on the register of each member, and the date at which any person ceased to be a member. In its ann. return to the Companies Registry, a C. must give, *inter alia*, a list of the names and addresses of its members; this return must also give the names of persons who have ceased to be members since the date of the last return; and it must contain a summary distinguishing between shares issued for cash and shares issued as fully or partly paid up otherwise than for cash; and specifying particulars as to the share capital of the C., the number of shares taken from the commencement of the C. up to the date of the return, the amount called up on each share, the total amount of calls received, and of calls unpaid, the number of shares forfeited, particulars of any discount allowed on the issue of any shares, the amount of share warrants issued, and the total amount of the C.'s indebtedness in respect of all mortgages and charges. No notice of a trust may be entered on the register (Section 117).

Directors. Every public C. registered after 1 Nov. 1929 must have at least two directors and every private C. at least one (Section 176). Both must have a secretary, but a sole director may not also be secretary (Section 118). An undischarged bankrupt may not act as a director or be concerned in the management of a C. Directors act as trustees and agents for the C. They are not personally liable on contracts expressly made on behalf of the C. The first directors are usually named in the articles, but if not named they are generally appointed by the persons named in the memorandum. The appointment of the director of a public C. is not valid unless he has (a) filed with the registrar his written consent to act, and (b) either (i) signed the memorandum for his qualification

shares, or (ii) taken up and paid for them, or agreed to do so, or (iii) signed a declaration that the requisite number of shares is registered in his name. Subsequent appointments are governed by the articles. In performing his duties a director must act with the utmost good faith and prudence. Unless negligent, he is not liable for the acts of co-directors. Provisions in the articles relieving directors, auditors, etc. from liability for default or breach of duty are void (Section 205), but Section 448 empowers the court to relieve a director who, having acted honestly and reasonably, ought fairly to be excused. A director is obliged by Section 199 to disclose any interest in any contracts made with the C. In the absence of agreement, directors are not entitled to remuneration. The C.'s accounts must show the aggregate of directors' emoluments, and the aggregate amount of past and present directors' pensions and compensation paid to them for loss of office. A fine of £50 may be imposed for failure to comply with the provisions relating to the disclosure of payments to directors and officers of the C. (Section 198 (4)). The removal of directors is generally governed by the articles, but Section 184 empowers the C. to remove them at any time by ordinary resolution. In these circumstances 28 days' notice of the resolution must be given; a copy of the resolution must be sent to the director, who is entitled to be heard at the meeting. The retiring age of directors of public C.s is fixed by the Act at seventy, but this provision can be excluded by the articles. Directors reaching the age of 70 may nevertheless be reappointed by resolution at a general meeting of which special notice stating his age has been given.

Shares. A share denotes a right to receive a certain proportion of the profits of the C. and of the capital of the C. when it is wound up. A member of a C. obtains his shares by allotment, his title being completed by the issue of a share certificate. Shares may be transferred in the manner provided by the articles of association. Transfer is usually effected by deed, and completed by registration of the transfer. Every shareholder is entitled to transfer his shares, subject to any restrictions that may be imposed by the articles; thus a shareholder may assign his shares to a man of straw to avoid liability on the winding up, if not prohibited by the articles. If the C. be wound up within 1 year of such a transfer, the transferor remains liable to the amount unpaid on his shares. Transfers may be made subject to the approval of the directors by the articles, but, generally speaking, the rules of the Stock Exchange will not allow any such restriction on fully paid shares. Where a shareholder fails to pay calls due on his shares, the shares may be forfeited in accordance with the articles. On the liquidation of the C. the amount outstanding on the shares must be called up.

Allotment of shares and debentures. (a) *Offered to public.* The prospectus must state the minimum subscription to the

proposed issue which the directors consider to be the essential amount required to provide for certain expenses (see *Prospectus* above). Shares may not be allotted before the minimum amount has been subscribed and the sum payable on application has been paid to the C. The amount payable on application must be not less than 5 per cent of the nominal value of the share or debenture. If these conditions have not been complied with within 40 days of the issue of the prospectus, the money must be repaid to applicants within the next 8 days. If not repaid after the forty-eighth day, it is repayable by the directors personally with interest at 5 per cent. On subsequent allotments, only the requirement that at least 5 per cent must be paid on application applies. (b) *Not offered to public.* At least 3 days before allotment, the C. must deliver to the registrar a 'statement in lieu of prospectus' in the statutory form. This applies only to the first allotment. Neither (a) nor (b) applies to private C.s. Where the prospectus offers shares and debentures to persons who are not existing share or debenture holders, allotment cannot be made until the third day after the issue of the prospectus.

Capital is generally divided into preference shares, ordinary shares, and deferred shares. Preference shares are usually entitled to receive a fixed dividend before any dividend is paid on the ordinary shares. Preference shares are said to be cumulative where any deficiency in the dividends accruing in a bad year rests to be made good out of the profits of subsequent years. Deferred or founders' shares, which are usually taken by the promoters, are generally entitled to a proportion of the profits if the dividend on the ordinary shares amounts to more than a fixed amount. Deferred shares are sometimes allotted as fully paid up, and sometimes issued by way of bonus to ordinary shareholders. Preference shares on the winding up of the C. are paid off in full before the ordinary shares are paid anything, where they are made 'preferential as to capital.' Where the C. by special resolution elects that any portion of its capital not yet called up shall be incapable of being called up except to wind up the C., such uncalled capital is *reserve capital*, and it cannot be dealt with or charged by the directors. Capital may be increased or altered if authorised by the articles; if not the C. may give itself power to do so by special resolution. Alteration of capital occurs where existing shares are either consolidated, as, for example, by changing every ten £5 shares into one £50 share, or subdivided, as, for example, by changing every £5 share into five shares of £1 each. Capital may also be altered by converting fully paid shares into stock. The essential distinction between shares and stock is that the former are issued in round sums, whereas the latter may be divided into any aliquot amounts; neither are the divs. of stock numbered as are shares. The conversion of shares into stock means that the shares

have been completely paid up, and that the time has come when the shares may be transferred in fragments. On the Stock Exchange stock is quoted at a certain price per £100 of stock, while shares are quoted at the price per share. A C. may by special resolution, with leave of the court, reduce its capital. A reduction which affects the C.'s creditors will be sanctioned by the court only if the creditors consent or are paid.

Dividends. Dividends must be payable only out of profits. Section 65, however, permits payment out of capital of interest on shares issued to raise money for certain long-term building or plant construction schemes. Such payments must be authorised by the articles or by special resolution, sanctioned by the Board of Trade, and not exceed 4 per cent or such other rate as is prescribed by order of the Treasury.

Debentures. A debenture is a document given to evidence the fact that money has been lent to the C.; it creates a charge on the C.'s assets, and provides for the repayment of the loan on the happening of certain events, as, for example, the making of an order for winding up the C., or an order for the appointment of a receiver. Debentures may be payable to bearer, or only to the registered holder; bearer debentures are transferable by delivery, and no notice of the transfer need be given to the C.

Meetings and Resolutions. The Act of 1929 provides that a C. must hold a general meeting within not less than one month and not more than three months from the date of commencing business. The purpose of this, the *statutory* meeting, is that all the shareholders shall have an opportunity of forming an opinion of the exact position of the C. within a short time of its commencement. The directors are required to send out to the shareholders seven days before the statutory meeting a report stating the number of shares allotted and the general state of the C. The articles usually provide for the convening of an *annual general* meeting. Special business is transacted at an *extraordinary* meeting; the directors are bound to hold an extraordinary meeting if required to do so by the holders of one-tenth of the issued capital. Voting at meetings may be by show of hands, or on a poll, according to the articles (*see* CASTING VOTE). Unless the articles make the voting dependent on the number of shares held, each shareholder has 1 vote. Resolutions are either ordinary, special, or extraordinary. An extraordinary resolution is one which has been passed by a majority of not less than three-fourths of the members voting at a general meeting of which notice specifying the intention to propose the resolution has been given. A special resolution is one which has been passed by a three-fourths majority, at a meeting of which at least 21 days' notice has been given. It was formerly necessary for a special resolution to be confirmed at a second meeting, but this is not now necessary. An extraordinary resolution appears to be effective only in the

case of the shareholders resolving that the C. cannot go on with its business and that it is advisable to wind it up.

Winding up is of three kinds: (a) by the court; (b) voluntary; (c) subject to supervision by the court. A C. may be wound up by the court if a special resolution has been passed to that effect, or if the C. does not commence business within a year of its incorporation, or if the C. is unable to pay its debts, or if the court is of opinion that it is just and equitable that the C. should be wound up. Winding up by the court is begun by petition, and any contributory or creditor may present a petition, but the court may refuse to order a winding up if the majority of the creditors oppose it. The most usual manner of winding up a C. is voluntarily. A voluntary winding up takes place when the period fixed for the duration of the C. by the articles has expired, or where the C. passes a special resolution to wind up the C. voluntarily, or resolves that as it cannot meet its liabilities it is advisable to go into liquidation. When a C. has passed a resolution to wind up voluntarily, the court may make an order that the voluntary winding up shall continue *subject to such supervision of the court and upon such terms and conditions as the court thinks just*. Whichever mode of winding up is adopted, a liquidator is appointed to call up the amount unpaid on the shares and generally to administer the property of the C. by applying the assets first in the payment of debts, and then, if there be any residue, among the shareholders according to their priority. On the winding-up order being made by the court the official receiver becomes provisional liquidator unless the creditors have chosen some other person to act as liquidator. The liquidator may bring and defend actions in the name of the C., and carry on the business of the C. so far as may be necessary for its beneficial winding up. Sometimes winding up is effected with the object of *reconstructing*, i.e. selling the undertaking of the C. to a new C. in return for shares in the new C. C.'s generally reconstruct when more capital is required, and when the only way to get it is to put pressure on existing shareholders, usually by inviting them to take up partly paid shares in the new or reconstructed C. in substitution for their fully paid shares in the old C. A shareholder who has not voted for the special resolution to wind up the C. may express his dissent to the liquidator, and require him to purchase his share interest in the old C., but he must dissent within a week of the resolution. The number of C.s on the registers in Great Britain at the end of 1937 was 155,279 (excluding those in course of liquidation or removal from the registers). Of these 17,761 were public and 137,518 were private C.s. After making various allowances, at the end of that year there were 14,677 public C.s with a paid-up capital of £4,067,035,904, and 137,493 private C.s with a paid-up capital of £1,828,814,099. The paid-up capital in each case was higher than any previously recorded. At the end of 1938

there were 147,861 C.s (England and Wales) on the register with a paid-up capital of £5,542,800,000; 9715 (Scotland), capital £447,800,000; and 1753 (N. Ireland), capital £45,500,000; a total of 159,329 with a paid-up capital of £6,036,100,000.

Private Companies. A private C. is defined by the Companies Act as one which limits the number of its members to 50 (exclusive of employees), restricts the right to transfer shares, and prohibits any invitation to the public to subscribe for shares or debentures. Usually all the shares are held by members of a single family. A private C. may consist of no more than 2 members. Such a form of C. is usually resorted to when a trader desires to have the advantage of limited liability without the disadvantage of sharing his profit with other persons. A number of partnerships have been converted into private C.s since the Act was passed, one great advantage of incorporation being that the death of a partner does not bring an end to the association, and a partner's interest may be continued in his son by giving the latter debentures in the C.

Accounts. Section 147 of the Act obliges C.s to keep such proper books of account as are necessary to give a true and fair view of the state of the C.'s affairs and to explain its transactions. The books must deal with all items of income and expenditure, sales, and purchases by the C. and the assets and liabilities of the C. The C. must prepare an. balance sheets and profit and loss accounts giving the information and in the form prescribed by the Act, so as to give a true and fair view of the state of its affairs for its financial year. All holding C.s must, with certain exceptions, furnish consolidated accounts for themselves and their subsidiaries so as to disclose a true and fair view of the position of the group as a whole. The accounts must be audited by a member of one of the professional bodies of accountants recognised by the Board of Trade.

Investigation of C.s. An investigation of a C.'s affairs by the Board of Trade may be applied for by not less than 200 members or by members holding not less than one-tenth of the shares issued. It may in any case be ordered by the court, and the Board of Trade can itself order an investigation if it considers that the matter is one of public concern—subject to there being circumstance of maladministration or of oppression of members. See Sir Francis Palmer, *Company Guide*, 36th ed. 1950; *Company Law*, 20th ed. 1956, and *Private Companies*, 47th ed. 1956; F. Shackleton, *Law and Practice of Meetings*, 3rd ed. 1951; L. C. B. Gower, *The Principles of Modern Company Law*, 1954; A. Topham, *Principles of Company Law*, 12th ed. 1955.

Comparative Anatomy, that portion of the science of anatomy which concerns itself with the comparison of the structures of various classes of animals. It is of great importance in the science of biology. See ANATOMY, BIOLOGY, and the articles on the various forms of life,

and those on the different parts of the body.

Comparative Ethics comprises the study of the moral standards by which man has lived from the earliest times to the present day. This study does not aim at evaluation; but although conduct does not become ethical until it is guided by a consciously held principle of what is right and what is wrong, C. E. takes us back to primitive times. The life of primitive man, as soon as he came to live in family and tribal groups, was hedged about by rules and taboos which were ethical in so far as they were directed towards securing the highest good for the individual or the tribe to which he belonged. Primitive morality, however, was governed by fear and the desire to placate the gods. Even among the ant. Egyptians ethics were a form of piety towards the gods, but the spirit pervading Gk ethics was essentially different. In the words of Apuleius: 'The Egyptian deities were chiefly honoured by lamentations, and the Gk divinities by dances.' The Egyptian Book of the Dead, however, inculcates a high standard of conduct, of a restrained and prudent kind. The influence of oriental religions, with the mysticism found in Egyptian and Semitic religions, tended to produce a system of ethics which superseded the purely Gk spirit. The Brahmanic code of India and the Zoroastrian code of Persia both taught a moral law which was part of the divine will. While the former was ascetic and pessimistic, the latter was active and optimistic, preaching a dualism of good and evil and a conflict between them in which man must play an active part. Ethical teaching divorced from religion also had its roots in the E., in the teaching of Gautama-Buddha and of Confucius. Gautama preached a resignation to evil, but Confucius laid down common-sense rules of conduct and courtesy which have been the mainstay of the Chinese polity ever since. Lao-Tze, however, a contemporary of Confucius, had considerable influence in teaching that everything had its essential character which it was useless to try to alter. The Neo-Platonists became mystical and polytheistic; but Plotinus, their founder, remained monotheistic, and he had considerable influence on Christian ethics, as also did the teaching of the Stoics. The ethics of Porphyry, the disciple of Plotinus, were very similar to those of his Christian contemporaries, and the antagonism between them is therefore surprising. The fathers of the Church did, indeed, borrow largely from earlier philosophies, but they were interested in dogma rather than ethics, and the problem of conduct did not claim precedence over science and politics until the 18th cent. The Eng. philosophers, Locke, Berkeley, and Hume (qq.v.), advocated a morality founded on practical experience. Later in the century came the utilitarian hedonism of Bentham, from which were born the humanitarian ethics of the 19th cent. In the meantime, however, Kant had estab. morality as law, man's law unto himself. See W. E. H.

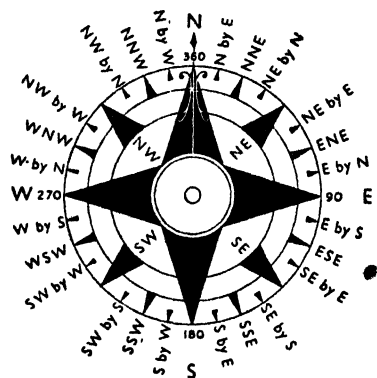
Lecky, *History of European Morals from Augustus to Charlemagne*, 1869; E. A. Westernmark, *Origin and Growth of the Moral Ideas*, 1906-8; L. T. Hobhouse, *Morale in Evolution*, 1906; H. Sidgwick, *Outlines of the History of Ethics for English Readers*, 1931.

Comparative Philology, see LANGUAGES, CLASSIFICATION OF; LINGUISTIC FAMILIES; PHILOLOGY.

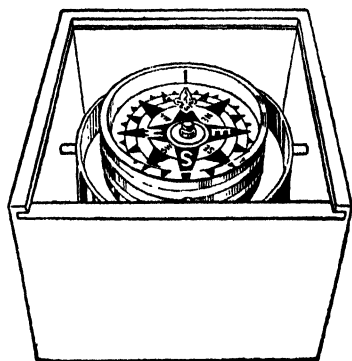
Comparative Religion, see RELIGION.

Comparesetti, Domenico Pietro (1835-1927), It. scholar, b. Rome, where he studied at the univ. He later became one of the chief classical scholars of Italy, being appointed prof. of Greek at Pisa in 1859. Of his works on classical literature

gives us N. by E., NE. by N., NE. by E., E. by N., etc., as shown in the figure. The reading off of the thirty-two points in order, going round either way, is known as 'boxing the C.' The needle swings on a jewelled pivot which rises perpendicularly from the centre of a bowl, which has a glass covering to protect the needle. The C. is generally situated in the binnacle, but other varieties of C. are known as standard, hanging, and steering C.s, according to their position on the ship. Until the end of the eighteenth century Brit. naval C.s were very carelessly constructed, but since that time much progress has been made. The C. at present in general use is that patented



THE POINTS OF THE COMPASS



Philip Harris, Birmingham
MARINER'S COMPASS

the best known are an ed. of the *Euxenippus* of Hyperides, monographs on Pindar and Sappho, and trans. of some fragments of Hyperides. His researches concern the *Book of Sindbad* and *Virgil in the Middle Ages*. He also ed. a collection of It. national songs. He d. at Florence.

Compass, Magnetic, or Mariner's Compass, instrument for determining the magnetic meridian and its angle to a given direction. It consists of a magnetised needle turning on a pivot, and is used chiefly for directing the courses of ships at sea. The ordinary C. is composed of three parts, the box or bowl, the card, and the needle. The needle consists of a fine magnetised strip of steel, or of sev. magnetised strips joined together. Fastened to the needle, and moving round with it, is a circular card having its circumference divided into 360 degrees. In addition to this it is marked with the thirty-two points of the C. The four cardinal points are N., E., S., and W. and the directions midway between these are NE., SE., SW., NW. The spaces between these eight points are again equally divided as NNE., ENE., ESE., SSE., etc. The last sub-div. of the sixteen spaces

by Sir Wm Thomson, elevated to the peerage as Lord Kelvin, in 1876. A special form of magnetic C. is used on aircraft, and a gyroscopic C. is employed on both ships and aircraft (see GYROSCOPE). Two important forces combine to form the error of a ship's C. One of these is the attraction of the ship itself. The magnetic influences of the hull, machinery, and metal work in general all affect the needle and divert it from its proper position. The error thus caused is known as the *deviation* of the C., and is met in various ways. First, the C. is situated or placed some distance above the upper deck so as to be less susceptible to these influences. Secondly, the deviation is diminished by placing magnets and bars of soft iron in such a position around the C. that the attraction of the rest of the ship's metals is neutralised. Thirdly, deviation charts are made, showing carefully the deviation of the particular C. when pointing in various directions. A second error is known as the *variation* of the C. When free from deviation, the needle points to the magnetic pole of the earth and not to the geographic pole. The two are differently situated and hence occurs the variation of the C. This variation varies

considerably at different parts of the earth's surface, and at certain points becomes nil. The variation changes from year to year, gradually rising to a maximum and then diminishing again. Irregular sources of variation are found in magnetic storms and similar electric disturbances. The dip of the C. induced vertically by the magnetic field of the earth, also varies. An azimuth circle is used to take bearings, and to discover the angle between the C. N. and the true N., the total error made up of variation and deviation. This circle has reflecting mirrors and sighting wires, and fits over the top of the C. bowl. Thus, from the position of the sun, when from 8° to 15° high, the amplitude, or azimuth, is made out. The early hist. of the C. is somewhat obscure. It was known to the Chinese at a very early date, and their own historians ascribe its discovery to the year 2634 bc. Certainly it was in common use in the Far E. by the end of the 3rd cent. AD. However, the Chinese were not inclined to take a high place as navigators, and their knowledge never led to the perfecting of this aid to navigation. It was once reputed that the principle of the C. was introduced into Europe by Marco Polo on his return from travels in Cathay, but it was well shown by Chappell (*Nature*, 346, 15 June 1876) that early in the 12th cent. the knowledge had been arrived at by independent discovery. Some ascribe the discovery of its variation to the same century, but others ascribe it to Columbus. The terror that was caused by the variation of the magnetic needle on this explorer's voyage to America is well known, and certainly led the way to further knowledge on the subject. See GEO-MAGNETISM; MAGNETISM.

Compass Berg, mt. in the Schnee Berge range, Cape Province, S. Africa, 30 m. N. of the tn of Graaff Reinet (q.v.). It rises 8200 ft above the sea and is the highest point in the prov.

Compass Plant, see SILPHIUM.

Compasses, instruments for describing arcs and circles, or for measuring distances. They generally consist of two legs joined together at one end by a hinged joint, and having one leg furnished with a pen or pencil. C. are divided into common, spring, beam, and proportional C., according to their kind. Triangular C. have three legs, so that the three points of a triangle may be transferred at once. Hair and bow C. are additional varieties.

Compasses, Elliptic, see ELLIPTIC COMPASSES.

Compensating Beam. A C. B. may often be seen fitted between the springs of the driving-wheels of a locomotive, in which case it is pivoted at its centre and supports the hangers of the two springs at its extremities. Any damage that might arise from a greater shock or jerk on one spring due to faults in the track, etc. is in this way minimised, for the motion of the C. B. effects an equalisation of the shock by transmitting it to the other spring. C. B.s appropriately arranged are used on various machines for the same reason.

Compensating Winding, on a.c. commutator motors, a winding for neutralising the cross-field, at right angles to the mainfield, due to the self-induced e.m.f. in the armature. The C. W. is either connected in series in the main circuit or short-circuited upon itself, in which case the action is like that of a short-circuited transformer secondary. See ELECTRIC MACHINES.

Compensation, see COMPULSORY ACQUISITION OF LAND.

Compensation, Workmen's, see WORKMEN'S COMPENSATION.

Compensator, auto-transformer (q.v.) used for starting a.c. motors, the voltage being gradually increased, from an initially small value, by tap-changing. The capacitor used for improving the power factor (q.v.) of an induction motor is sometimes called a C.

Competition. Perfect C. is the state of affairs in which a commodity or service is produced by such a large number of producers that each cannot affect the price by altering his output. The more control each producer has over the price by altering his output, the less perfect the C. becomes. When one producer has complete control over the price, the commodity or service is said to be produced under conditions of monopoly (q.v.). In the real world most commodities are produced under more or less imperfect C. Only basic commodities traded internationally, such as wool, metals, wheat, and so on, where buyers and sellers are in touch with one another by telegraph and other modern communications, are sold in perfectly competitive markets. On the other hand, C. is not as imperfect as is often supposed: although there may be few producers of a particular commodity or service, they compete with producers of similar commodities and services, and 'monopolists' often compete fiercely with one another.

Economists distinguish degrees of C. between the two extremes of perfect C. and monopoly. 'Duopoly' is C. between two sellers; 'oligopoly' is C. between a small number of sellers. A common error about the place of C. in the modern economy is that it has been replaced by forces making inevitably for C. On the contrary, much imperfect C. and monopoly are the result of State action or inaction fostering them or permitting them to continue. The laws on patents, inventions, licensing, control of imports, and outright nationalisation create monopoly or highly imperfect C. as a conscious aim of policy. And the State's commercial laws on contracts, the conduct of companies, and so on, may permit monopolistic arrangements in restraint of trade.

C. can be made imperfect by heavy costs of transport, so that producers in a given area are protected from outside C., and by the ease with which consumers can be persuaded by advertising and other marketing techniques to prefer some brands to others although there is little essential difference between them. The degree of competitiveness of an economic system tends to be under-estimated

because insufficient account is taken of change. Over a period, new industrial processes and techniques and changes in fashion and tastes tend to disperse monopolies possessed by individual firms. Another error is to confuse the nature of C. with its symptoms—the forms it takes in actual commercial practice. Often action taken to suppress C. merely drives it from one form into another: a common example is control of prices by gov. or by agreement between firms, which leads to increased C. in quality, credit terms, etc.

In Britain between the wars, C. lost much public sympathy because it seemed to make for unemployment. But this was probably because the economic system was having to adjust itself to deep-lying changes in international supply and demand. If monetary conditions are such that the economy can be kept more or less fully employed, C. can be an effective force making for economic progress. After the Second World War public opinion seemed to accept this view, and laws were passed against monopoly. See MONOPOLY; CARTEL; TRUST; RESALE PRICE MAINTENANCE. See also W. H. Hutt, *Economists and the Public*, 1936; L. C. Robbins, *International Planning and Economic Order*, 1937; Ludwig Erhard, *Prosperity through Competition*, 1958.

Compiègne, Fr. tn, cap. of an arron., in the dept of Oise, on the l.b. of the Oise (q.v.). It stands at the N.W. end of the beautiful forest of C., once a favourite hunting-ground of the Fr. kings, which covers 36,000 ac. There is a splendid château, founded in Merovingian times, rebuilt by Louis XV, and later embellished by Napoleon I (q.v.); it contains fine paintings and tapestries, and has a museum of carriages. The tn hall dates from the 16th cent., and there are 2 sanct churches of note. C. is a fashionable holiday tn for the Paris region, and it has machinery, printing, rubber, and timber industries. The tn is said to date from Rom. times, and it was later the site of a hunting lodge of the Frankish kings. The Emperor Charles II (q.v.) founded at C. the great abbey of St. Corneille, and built 2 castles in the neighbourhood. It was at C. that Joan of Arc (q.v.), making a sortie from the tn during a siege, was taken by the Burgundians in 1430. Situated on the direct route to Paris from Belgium, it was impossible for C. to avoid being overrun during the First World War by the Gers. in their advance on the cap. in 1914. When the Allies counter-attacked at the first battle of the Marne, the Gers. tried to hold the line of the R. Aisne, with their right flank, under Gen. von Kluck, resting on C. Marshal Joffre, however, having organised his army for a still further counter-advance, drove the Gers. back far beyond C. within a fortnight of that battle. C. was again the strategically-important objective of the Ger. armies in June, 1918, when Marshal Ludendorff ordered Gen. von Hutler's army, then posted between Montdidier and Noyon, to attack with no fewer than 15 divs. on that part of the front. His plan was to link up the Marne and Amiens

salients, made earlier that year in the Brit. lines, and thereby eliminate the great bulge in his own line and so capture C., and again endanger Paris. The essential element of surprise was lacking, and contributory factors to the complete failure of Von Hutler's attack were the obstinate resistance of the Fr. at Rheims and the entire success of the Amers. at Château Thierry; and in 4 days his effort on the Oise had ceased (13 June, 1918). It was in the forest of C. that the armistice between the Gers. and the Allies was concluded on 11 Nov. 1918. In the same railway coach which Foch used when the Allies granted the Gers. the armistice of 1918 and in the same spot in the forest of C., Hitler, and his associates, on 21 June 1940, met Gen. Huntzinger and the other Fr. delegates to conclude the armistice sought by the Pétain (q.v.) Gov. in the Second World War. The centre of the tn and those parts lying near the railway were severely damaged during the war. Pop. 18,500. See ARMISTICE.

Complement, term with many applications. In geometry, the C. of an angle is that angle which added to it will make 90°. So the C. of 30° is 60°. Again, the C. of an arc is that required to make it a quadrant. In astronomy, the C. of a star's altitude is its zenith distance. In music, any two intervals which make up an octave are complementary. In arithmetic, the C. of a number is that required to raise it to the next power of 10. Thus 7 is the C. of 3, 89 of 11, 0.254 of 9.746. In chromatics, the C. of any colour is that one which added to it will give white, e.g. red is the C. of greenish-blue, and yellow of indigo-blue (see COLOUR).

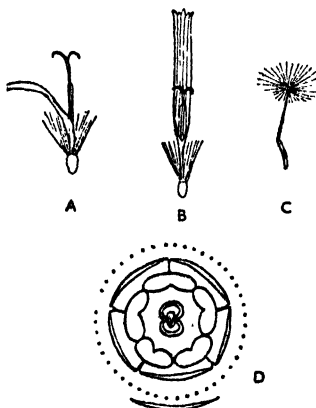
Complex Number. The theory of C. N.s is a branch of mathematics. A C. N. consists of two parts, one real and one called imaginary, e.g. $10+3i$ is a C. N., where 10 is the real part and $3i$ the imaginary part. 1 or $\sqrt{-1}$ is defined by the equation $\sqrt{-1} \times \sqrt{-1} = -1$. It is imaginary in the sense that the square of a real number whether positive or negative is a positive quantity. The symbol i is of great use in mathematical analysis. The factors of x^2+y^2 are written $(x+iy)(x-iy)$, each factor being a C. N.

A C. N., $a+ib$, is often written in the form $r(\cos \theta + i \sin \theta)$, where $r = \sqrt{a^2+b^2}$, and $\tan \theta = b/a$. To multiply two C. N.s we use the fact that $i^2 = -1$. Thus $(a+ib)(c+id) = ac+iad+ibc+i^2bd$, i.e. $(ac-bd)+i(ad+bc)$. If $a+ib = r_1(\cos \theta_1 + i \sin \theta_1)$ and $c+id = r_2(\cos \theta_2 + i \sin \theta_2)$, their product can be written $r_1 r_2(\cos \theta + i \sin \theta)$, where $r = r_1 r_2$ and $\theta = \theta_1 + \theta_2$.

Capitulum, see ALCALA DE HENARES.

Compositae, largest family of plants, containing over 13,000 species which are world-wide in distribution. The inflorescence is practically always a capitulum, and the flowers are surrounded by one or more external rows of bracts forming an involucre; the flowers collected in a single head may often comprise hermaphrodite, pistillate, and sterile florets. The calyx is often absent, but its usual form is a pappus of hairs, e.g. in the dandelion,

which develops after fertilisation, forming the familiar parachute by which the fruits are dispersed. The corolla is gamopetalous, and may be tubular, ligulate, or labiate (see COROLLA). There are 5 stamens inserted on the corolla, and they alternate with the petals; the anthers are united (syngenesious). The fruit is a cypsela with an exalbuminous seed. Self-pollination is the general rule among the plants, though cross-pollination is also common, and distribution of the seeds is effected most often by animals and the wind. The plants in the family are mostly herbaceous, but sometimes shrubby or tree-like. The root is usually a tap-root, often thickened, e.g. in the



COMPOSITAE: THE DANDELION

A, single floret, side view; B, single floret, front view; C, fruit with tuft of hairs (pappus); D, plan of floret.

dandelion, sometimes tuberous, e.g. in the dahlia. The leaves are usually exstipulate, radical, or alternate, but in some cases, e.g. in the sunflower, they are opposite. In many species laticiferous vessels are found containing the milky juice well seen in the dandelion and sow-thistle, and oil-ducts are very commonly present. Few of the plants are of economic importance, but many are cultivated for their beauty. Important genera are: *Achillea*, *Ageratum*, *Amellus*, *Ammobium*, *Anthemis*, *Arctagis*, *Artemisia*, *Aster*, *Bellis*, *Calendula*, *Callistephus*, *Carduus*, *Cassinia*, *Chrysanthemum*, *Cichorium*, *Cineraria*, *Coreopsis*, *Cosmos*, *Dahlia*, *Doronicum*, *Echinops*, *Emilia*, *Erigeron*, *Gaillardia*, *Gazania*, *Gerbera*, *Gnaphalium*, *Helenium*, *Helianthemum*, *Helichrysium*, *Hellepteryx*, *Inula*, *Layia*, *Liatris*, *Olearia*, *Petasites*, *Rudbeckia*, *Santolina*, *Scolymus*, *Senecio*, *Silphium*, *Solidago*, *Scotus*, *Tagetes*, *Taraxacum*, *Tolpis*, *Tussilago*, *Ursinia*, *Venidium*, *Waltia*, *Wulfia*, *Xeranthemum*, *Zinnia* (qq.v.).

Composition, in bankruptcy, the scheme of arrangement of his affairs proposed by a debtor after a receiving order has been made against him, embodying in writing the terms upon which he is desirous of satisfying or compromising the claims of his creditors. See BANKRUPTCY.

Composition and Composer (of type), see under PRINTING; TYPE AND TYPE-FOUNDING; TYPE-CASTING AND TYPE-SETTING MACHINES.

Composition of Vectors, in mechanics, refers to such vectors as velocities (see VELOCITY) and forces (see PARALLELOGRAM OF VECTORS). The converse of C., as will be seen later, is *resolution*, and these two problems, i.e. of the C. and resolution of vectors, form two of the fundamentals of the science of mechanics.

Consider, e.g., the C. and resolution of velocities (see DYNAMICS). A body cannot be in two places at the same time, therefore it cannot move in two different directions at the same time. But it is often convenient and even necessary to regard the motion of a body as being compounded of sev. velocities, usually in different directions. These various velocities are termed the component velocities, while the actual velocity is said to be the resultant velocity, and the process of finding this resultant velocity is termed compounding the velocities. Thus, supposing one steamer passes another going in the same or the opposite direction, then the resultant velocity of one steamer relative to the other is the algebraic sum of the velocities of the steamers, which are the component velocities. The velocities are added or subtracted according as the steamers are going in opposite or the same directions. But take the case of a ball thrown up in a railway carriage in motion. In this case the ball moves upwards under its own velocity and at the same time continues forward with the velocity of the train. In this case, and all cases where the directions of the velocities are different but are co-planar, the theorem known as the parallelogram of vectors (q.v.) is used. 'If two component vectors be represented in magnitude and direction by the two adjacent sides of a parallelogram drawn from a point, then their resultant vector will be represented by the diagonal of the parallelogram drawn from that point.' Other theorems, such as the triangle, polygon, and parallelepiped of vectors, aid in finding the resultant vector in particular cases. All these theorems concern the C. of V., but if the resultant vector is given and it is required to find the component vectors it would be necessary to use the process called the resolution of vectors. This is evidently the converse problem to the C. of V., and it is clear that just as it is possible to construct an infinite number of parallelograms around a diagonal, so there are an infinite number of possible component vectors to any given vector. When, however, the resolved component vectors required are to be at right angles to each other, as they usually are, then the problem is capable of an easy solution. See DYNAMICS; STATICS.

Compost, *see* GARDENING.

Compostela, Santiago de, *see* SANTIAGO.

Compound, *see* CHEMISTRY.

Compound Engine, steam engine in which the expansion of the steam is divided into two phases, the first being effected in the high-pressure, and the second in the low-pressure, cylinder. The two phases may be divided over 3 cylinders by dividing the steam from the high-pressure cylinder to supply 2 low-pressure cylinders, or by having 2 high-pressure supplying 1 low-pressure cylinder. This should not be confused with the triple expansion engine, in which the steam passes successively through 3 different cylinders.

Compound Householder, occupier of a 'small tenement,' whose rates are included in his rent. This happens principally where rating authority compounds with the owner or landlords for the payment of the rates. The various Acts concerning the registration of voters require that those claiming the occupation franchise be separately rated. But the Poor Rate Assessment and Collection Act, 1869, provides that in cases where the rateable value of a house does not exceed £20 in London, £13 in Liverpool, £10 in Birmingham or Manchester, and £8 elsewhere, the owner may agree with the rating authority to become liable for the rates himself whether his property be occupied or not, and that the rating authority may allow him a commission not exceeding 25 per cent on the rateable value. The Act also provides that the rating authority may order the owner to be rated instead of the occupier, subject to an abatement or deduction of 15 per cent. In such cases the C. H. is deemed to be separate for the purposes of the occupation franchise. The object of the Act of 1869 was to obviate the great expense and loss of time consequent on the collection of the rate from the numerous small occupiers. (Ryde on Rating, 3rd ed. 1956).

Compound Interest, *see* INTEREST.

Compound Quantities, in algebra, are figures consisting of more than one term; in arithmetic they are quantities expressed in terms of various denominations, as cwt, qr, lb.

Compound Winding, field winding on d.c. electric machines (q.v.) consisting of both shunt and series turns, used especially on traction generators to obtain a rising voltage on increasing load (over-compounding) or normal full voltage at a given load current. As the load current increases, this higher current, which goes through the series turns, increases the field, and thus the voltage. In ordinary compounding the number of series turns is so determined that the increase of the field at the given load current is just sufficient to compensate the volt drop that would occur with the shunt winding alone.

Compounding Offences. Compounding a felony means forbearing to prosecute a person who has committed a felony in consideration of some reward received, as for example agreeing not to prosecute a thief in consideration of receiving back the

stolen goods. Compounding a felony is a misdemeanour punishable by fine and imprisonment. The pub. of an advertisement in a newspaper or by any other means offering a reward for the return of stolen or lost property, *coupled with words indicating that no questions will be asked or inquiry made* on the production of the goods, renders the advertiser, printer, and publisher each liable to a penalty of £50. Compounding misdemeanours without proper leave is also an offence. But where a particular misdemeanour more closely affects an individual than the public at large, the court will sometimes allow the accused, before any judgment is pronounced, to settle with the prosecutor, when a nominal sentence only will be inflicted. *See also* CONCEALMENT.

Compressed-air Baths are made of iron plates riveted together, of such a strength that they can withstand pressure. Air is pumped into the chamber until the required pressure, indicated by barometers, is reached. These baths will hold two or more persons. Another manner in which compressed air is used is that in which a mask fitted with tubes and valves is fitted tightly over the mouth and nose. The patient can then inhale compressed air and breathe out into rarefied air. The use of these in treating disease comes under the term *aerotherapeutics* (q.v.). The use of compressed air tends to lower the frequency of the chest and heart movements while increasing the oxygen absorption and the blood tension; the action of rarefied air will, of course, be opposite.

Compressed-air Motors, machines that use air which has been raised by a special compressor to a pressure above that of the atmosphere. They should not be confused with air engines (q.v.), which work on a different principle.

C.-A. M. have attained considerable use in mines and elsewhere, for driving cutters (*see* COAL MINING), driving drills for boring holes in rocks and in tunnelling operations, for manipulating hammers, riveting (q.v.), in sculpturing, and, on a small scale, for sheep-shearing. All these machines require to be portable and easily handled and controlled, and C.-A. M. can be supplied with air through flexible tubes, and consequently the power generators do not add weight to the motor, nor do they make the rigid portion of the machines large and therefore cumbersome. Further, the working parts are not at a high temp., and therefore the danger attached to their use is less than in the case of steam. Compressed air can, of course, be stored in cylinders without loss of power. Stored in this manner at a pressure approaching 2000 lb. per sq. in., in reservoirs under the vehicle, it has been used as the motive force for driving tram-cars; it has also, even at much greater pressure, been used in motor cars. Again, pneumatic tubes for transmitting letters and small parcels of all kinds are worked partly by compressed air and partly by exhaustion. Further, in some of the Amer. arsenals locomotives are driven by compressed air, and their advantage over

steam engines in the neighbourhood of explosives is easily understood. Lifts or elevators, and the automatic brakes on passenger trains, are sometimes worked by compressed air. One of the most important uses is as locomotive power for torpedoes. Sometimes the air is heated before it reaches the motor. This causes it to expand, and the power is thus increased, in some cases by as much as 30 per cent. The pneumatic hand-hammer is much used for riveting. The supply of compressed air is obtained from a unit driven by a petrol engine, mounted on a small truck, the power being conveyed by flexible armoured tubing. The pneumatic road drill is taking the place of the pick. In mining machinery there are two main types of C.-A. M. used to drive pneumatic tools: (a) turbine-type and (b) cylinder-type motors. In the former the C.-A. M. consists of three parts, a stator and two rotors. The rotors, which revolve inside the stator, consist of two V-shape-toothed gear-wheels meshing together; the inflowing air is forced on to both gears, and the teeth of the gears as they revolve form valves and stop the air from escaping to the other side of the gears. In the cylinder type of machine the motive force is obtained from the motive action of two or more cylinders; the valves, which are driven from the crankshaft, admit the air, which drives down the piston, and at the end of its motion the air escapes from ports on one side of the cylinder casing. See PNEUMATIC POWER TRANSMISSION; PNEUMATIC TOOLS; STEAM AND POWER HAMMERS. See also D. Hraid, *Compressed Air in Engineering Production*, 1943.

Compression and Compressibility. When a body is acted on by a force in such a manner that it decreases in volume, it is said to be compressed, and the diminution in volume is its compression. The term compressibility is sometimes used to denote this property of yielding to pressure, but strictly used it represents the extent of this property as possessed by various substances. Different bodies will diminish by different amounts under the same pressure, and to represent this varying amount of yielding, compressibility is defined as being the ratio of the amount of compression per unit of volume to the pressure applied. So it is found by measuring the amount of compression of a given volume under a given pressure, and dividing this by the product of the original volume and the pressure. This gives the average compressibility per unit of pressure, and the unit of pressure is usually taken as one atmosphere, or the weight of a sq.-in.-section column of mercury, 29.905 in. (760 mm.) in height at a temp. of 0° C., weighed at sea level. This is really equal to 14.7 lb. weight per sq. in. The compressibility of gases is greater than that of liquids or solids. For gases, the relation between pressure and volume being determined by Boyle's law, that the volume is inversely proportional to the pressure, it follows that the diminution in volume grows less as the pressure becomes greater, i.e. that the compressibility is

inversely proportional to the pressure. Liquids are compressible, e.g. water can be compressed, although the compressibility is less at high than at low temps. and pressures. Measurements of the compressibility of liquids are made in an instrument called a piezometer. Thus it has been proved that the compressibility of water at 10° C. and a pressure of 1 ton per sq. in. is approximately 1/20,000. Sea water is roughly 10 per cent less compressible than fresh water. Mercury has the smallest compressibility of any fluid, its compressibility being roughly one-sixteenth that of water. The compressibility of solids is very much smaller than that of gases or liquids, and except for theoretical purposes can be neglected. In measuring the compressibility of liquids, however, corrections must be made for the compressibility of the instrument employed. This being usually of glass, careful measurements have been made of its compressibility. This varies for the different kinds of glass but is roughly about one-twentieth that of water.

Compression-Ignition Engines, see DIESEL ENGINES.

Compressors. C. are used chiefly in connection with mining machinery. There are two main types of C., namely reciprocating and rotary C. The first is the more widely used, and there are many models, all varying in design and action. The low-pressure compressor, up to 200 lb. per sq. in., is a single-stage compressor, i.e. the air is compressed by the single action of one piston. In pressures of 200 lb. and over the C. are two, three, four, or multi-stage C., i.e. the air is first compressed in one cylinder, and then suffers one or more subsequent compressions before it is finally stored. The valves of a compressor are of two types: those placed in the cylinder casing and those fitted in the piston itself; the valves in both cases are automatic in action, being opened and closed by the suction and compression strokes of the piston. In recent years high-speed C. have been developed in connection with refrigerating plants, and for liquefying gases such as air, with the object of subsequently separating their constituents by evaporation. Most ammonia C. are the single-acting enclosed type with the ammonia in the crank case; the valve ports are situated in the cylinder walls and lie between the limits of travel of the upper and lower parts of the piston.

Compromise Measures of 1850. These were a series of measures which had for their object the settlement of five questions in dispute between the pro-slavery and anti-slavery factions in the U.S.A. As a fact the compromise of 1850 settled nothing, but 'was compounded by every element of the country's politics, and may be made to yield on analysis almost every ingredient of the historian's narrative.' Ter. had just been acquired by conquest and purchase from Mexico; Texas had just been admitted to the Union, and the perplexing question was the extension or restriction.

of slavery, for it threw obstacles in the way of a plan and gov. for the new ter., and made the determination of the Texan boundary a matter of grave sectional interest. Part of the country wanted the slave trade abolished from the Dist. of Columbia—the seat of the national gov.—and slavery from the new ter. the other part urged with equal vehemence that the slavery question was a matter for decision by the framers of the state constitution (when it should come to be formed) of the new ter.

The result of this controversy was the series of measures framed and introduced by a committee of which Henry Clay was chairman, called the C. M. of 1850, which were signed by the President in September of that year. It was agreed (1) that Texas should be paid 10,000,000 dollars to relinquish her claim upon any portion of New Mexico; (2) that California should be admitted as a state under a constitution which prohibited slavery; (3) that New Mexico and Utah should be organised as ters. without any regulation in respect of slavery, leaving it to the election of their own settlers whether there should be ownership of slaves or not; (4) that the slave trade should be excluded from the Dist. of Columbia, but be interfered with nowhere else by the Federal law; and (5) that the whole judicial and administrative machinery of the Federal Gov. should be put at the disposal of the S. slave-owners for the recovery of fugitive slaves found within the free states. There seems little doubt that the C. M. helped to postpone secession and civil war for some years, during which time the NW. grew more wealthy and was brought into closer touch with the NE. states. See *Cambridge Modern History*, vol. vii, chap. xii, and J. F. Rhodes, *History of the U.S. from the Compromise of 1850*, 1893–1906.

Comptat Venaissin (from *Venasque*, Lat. *Vindaxinum*) was a parallel div. to Comptat d'Avignon, the two being coas. of the papal states, held by the popes from 1228 to 1791. C. V. was, however, larger, having an area of 450,000 ac., and now forms more than half of Vaucluse. The country is fertile, with magnificent scenery. Ventoix (1912 ft) is the loftiest peak. The dist. is irrigated by a system of canals and by the Rhône, Durance, and Sorgue. Venasque is a tn in Vaucluse.

Compton, Arthur Holly (1892–), Amer. physicist, b. Wooster, Ohio. Graduated College of Wooster, 1913; instructor of physics in univ. of Minnesota, 1916–17; and research physicist of the Westinghouse Lamp Company, Pittsburgh, 1917–19. Came to England, and pursued research at Cambridge, 1919–20; prof. of physics at Washington Univ., St. Louis, Missouri, 1920–3; prof. of physics at univ. of Chicago in 1923. Awarded the Nobel Prize in 1927. In 1945 he was appointed chancellor of Washington Univ. His speciality is X-rays. Made first measurement of wavelength of hard gamma rays, discovered change in wavelength of X-rays when scattered (the so-called Compton Effect, q.v.). Amongst his books are

X-Rays and Electrons, 1926, 2nd ed. 1928; *The Freedom of Man*, 1935; *X-Rays in Theory and Experiment*, with S. K. Allison, 1935; *Human Meaning of Science*, 1941; *Atomic Quest*, 1957.

Compton, Denis Charles Scott (1918–), Eng. cricketer and footballer. He made 114 on his debut at Lord's (London Elementary Schools v. C. F. Tufnell's XI, 1932). Debut for Middx, 1936, and for England, 1937. He has toured Australia and New Zealand, S. Africa and W. Indies. His aggregate in 73 tests is 5565 runs. In 1947 he made the record first-class aggregate of 3816 runs and 18 hundreds in a season. He is also a slow left-handed bowler. Retired from professional cricket, 1957; created C.B.E., 1958. He joined Arsenal Football Club in 1932, and was in the winning Cup side, 1950. He represented England in 10 war-time international and in the Victory International v. Scotland, 1946. See his autobiographies *Playing for England*, 1948; *In Sun and Shadow*, 1952; also E. W. Swanton, *Denis Compton: a Cricket Sketch*, 1949.

Compton, Fay (1894–), actress, b. London, daughter of the distinguished actor and actress Edward C. and Virginia Bateman. She made her first stage appearance at the Royal Albert Hall at Christmas 1906, in a Christmas fantasy entitled *Sir Philomor*, or *Love's Victory*, and in the theatre proper when she joined the famous Follies, 1911; she married H. G. Pélissier, the leading genius of the troupe, who d. 2 years later. Fay C. has had a long and brilliant career and is one of the most versatile actresses of the Eng. theatre. She has played leading parts in straight plays, farces, musical comedy, and revue. She is a most accomplished Shakespearian actress and is one of the finest Ophelias the Eng. stage has known. She has played with great success in America, Australia, and almost all over the world, and has also had a very successful film and radio career.

Compton, Henry (real name Charles Mackenzie) (1805–77), comedian, b. Huntingdon. In 1844 he appeared as Touchstone in *As You Like It*, and at once became famous. Other roles were Blenkinsop in Tom Taylor's *Unequal Match*, Muggles in Byron's *Partners for Life* at the Globe Theatre, and Dr Panloss in *The Heir at Law*.

Compton, Spencer Joshua Alwyne, see NORTHAMPTON, MARQUESS OF.

Compton Effect (X-rays). Discovered in 1923 by A. H. Compton, this effect is the increase of wavelength of a beam of X-rays when scattered by substances. The change of wavelength is a function only of the angle through which the beam is scattered, and is independent of the nature of the scatterer. This change of 'colour' cannot be accounted for by the theory of electromagnetic waves (q.v.), which, however, accounts for many of the properties of X-rays (q.v.), known to be rays of extremely short wavelength. A satisfactory explanation was given by Compton, and also by Debye, in terms of quantum theory (q.v.). The effect is caused by scattering of X-ray quanta by

free electrons. Scattering by electrons bound to atoms leads to no change of wavelength.

Compton Wynnyates, beautiful Tudor mansion, once moated, some 12 m. SE. of Stratford-upon-Avon, Warwickshire, England, seat of the Marquess of Northampton. Begun in the 15th cent., it is built round a courtyard, with the arms of Henry VIII and Catherine of Aragon over the porch. There is a fine Great Hall, panelled, with two minstrels' galleries, carved screens, and a timber roof, and the house has a number of secret staircases and hiding-places. In the grounds is a church, rebuilt in 1665, with many memorials of the Compton family.

Comptonia Asplenifolia, or Sweet Fern, genus, the one species of its family Myricaceae. It is a small bush, 3 to 4 ft high, yielding a powerful aromatic fragrance when rubbed between the fingers. It is a native of the woods and mts of the U.S.A., and possesses tonic and astringent properties.

Comptroller, official title for one who keeps or audits accounts, used mainly for gov. offices, or in connection with the royal household, when it refers to a kind of steward or treasurer. Thus the C.-general is the head of the National Debt Office, the C. and auditor-general the head of the Exchequer and Audit Dept, etc. The word is more correctly spelt *controller*, as it comes from the Fr. *contrôle*, from Med. Lat. *contrarotulus*, a counter-roll or copy of a document used to check the original; in this form it is applied to the controller of the Navy and to the head of the Stationery Office in England, and in the U.S.A. to the controller of the Treasury and the controller of the currency, the latter being one who administers the law relating to national banks.

Compulsory Acquisition of Land. The Crown has a prerogative right compulsorily to acquire the land of private owners. In practice, however, even in war-time, it acquires land with statutory authority. The Brit. railway and canal systems were made possible only by a series of special Acts of Parliament empowering railway and canal companies compulsorily to acquire the land through which tracks and canals were to pass. The Lands Clauses Consolidation Act, 1845, was passed to provide a standard procedure for the compulsory acquisition of land and payment of compensation. It incorporated the provisions usually to be found in statutes empowering public utility companies and local authorities to acquire land. Subsequent statutes giving these powers would incorporate the relevant provisions of the Lands Clauses Act, 1845, which was later modified by a series of Lands Clauses Acts, passed between 1860 and 1895. The basis of assessment of compensation has been amended by the Acquisition of Land (Assessment of Compensation) Act, 1919, the Lands Tribunal Act, 1949, and the Town and Country Planning (q.v.) Acts, 1947, 1953, and 1954. This has been neces-

sitated by the wide compulsory purchase powers given to local authorities to carry out town development schemes. Land may be permanently acquired or merely requisitioned for public purposes during an emergency. An acquiring authority may require only a limited interest in land (e.g. the control in its development) or do some act called 'injurious affection,' which in some way diminishes the landowner's enjoyment of his land (see LOCAL GOVERNMENT).

An acquiring authority (e.g. gov. dept, local council, or nationalised industry) will normally derive its powers from one of the following sources: (1) A public general Act which empowers it to acquire unspecified land for particular purposes (e.g. building of highways, civil airfields, or housing estates). Sometimes, however, a gov. dept may introduce into Parliament a Bill authorising the compulsory purchase of a particular piece of land for a definite purpose, e.g. Public Works (Festival of Britain) Act, 1949. (2) A local council may obtain a special Act of Parliament conferring special powers (e.g. the Birmingham Corporation Act, 1946, empowered the corporation to acquire a considerable number of residential and business premises for the construction of a ring road). In 1956 Croydon Corporation sought powers to acquire property to enable it to carry out a road widening scheme. (3) Some local and general Acts empower in general terms authorities to acquire land for specified purposes subject to the obtaining of specific authority to take any particular piece of land. This is given after the holding of a public inquiry and the confirmation of the acquisition by an Act of Parliament. This procedure is rarely used. (4) The most common authority for compulsory acquisition is the compulsory purchase order, which is made by the acquiring authority and confirmed by the appropriate gov. dept after hearing any objections from interested parties.

In practice the procedure for the compulsory acquisition of land, however authorised, is usually carried out in accordance with a standard formula prescribed by the Acquisition of Land (Authorisation Procedure) Act, 1946. The essentials (subject to modifications in certain cases) are, broadly, the making of a compulsory order by the acquiring authority, its advertisement, service of notice on persons whose land is affected by the order, the hearing of objections, local public inquiries (where deemed necessary), and the confirmation of the order, usually by the Minister of Housing and Local Government.

The amount of compensation for compulsorily acquired land, if not agreed, is usually assessed by the Lands Tribunal, from which appeals on points of law only are considered by the court of appeal (q.v.). The basis of compensation varies according to the purposes for which the land is acquired. See M. W. Van Oss and N. MacDermot, *The Lands Tribunal: Law and Procedure*, 1950; C. A. Cripps, *Compulsory Acquisition of Land*, 10th ed. with

ann. supplements; R. D. Stewart-Brown, *A Guide to Compulsory Purchase and Compensation*, 1955.

Compurgator (Lat. *compurgare*, to purge completely), name given to a witness of character who swore to the character of the accused person in a trial. The word was used only in eccles. law until the 17th cent., when it was used by legal antiquaries in connection with the civil law. In Glasgow, up to the middle of the 18th cent. when the office was abolished, an official whose duty it was to clear the streets of strollers during the time of church worship on Sunday was called a C.

Comrades of the Great War, organisation of ex-service men which arose out of the First World War, absorbed into the British Legion (q.v.).

Comrie, par. and vil., Perthshire, Scotland, on the R. Earn, 6½ m. W. of Crieff. It lies on the fault line which divides the Highlands from the Lowlands and is subject to occasional earthquake shocks. Pop. 1800.

Comstock, Anna Botsford (1854-1930), Amer. naturalist and natural-hist. artist; b. Otto, New York; wife of John Henry C. (q.v.). Prof. of nature study, Cornell, 1920-2; associate director, Amer. Nature Association. Works include *Ways of the Six-footed*, 1903; *How to Know the Butterflies* (with her husband), 1904; *Confessions to a Heathen Idol*, 1906; *Handbook of Nature Study*, 1911; sixteen ph. ed., 1925; *Bird, Animal, Tree, and Plant Handbooks*, 1914; *Trees at Leisure*, 1916. Ed. *Nature Study Review*, 1917-23.

Comstock, John Henry (1849-1931), Amer. entomologist; b. Janesville, Wisconsin. U.S. entomologist, Washington, 1879-81. Prof. of entomology and invertebrate zoology, Cornell, 1882-1914, and responsible for the classification of insects according to the arrangement of wing veins. Works include *Report on Cotton Insects*, 1879; *Notes on Entomology*, 1888; *The Wings of Insects*, 1891; *Manual for the Study of Insects*, 1895; *Insect Life*, 1897; *How to Know the Butterflies* (with his wife), 1904; *The Spider Book*, 1912.

Comstock Lode, famous silver mine in Nevada, U.S.A., discovered in 1857; the richest known silver deposit, the mine may be said to have caused the rise of Nevada as one of the great gold- and silver-mining dists. of the world. It was financed chiefly from San Francisco, and the 'bonanza' boom of the seventies led to a financial panic. The Comstock dist. is exceedingly rich in both gold and silver, but the fall in the price of the latter resulted in great depression. Virginia City, built on the site of C. L., had a pop. of 11,000 in 1880; in 1940 of 950.

Comte, Auguste (1788-1857), Fr. philosopher, founder of Positivism; b. at Montpellier, where his father, a strong Royalist and Catholic, was the receiver-general of taxes. C. received his early education at the public school of his own tn, and later proceeded to the Ecole Polytechnique in Paris. About 1818 he came under the influence of Saint-Simon, a relative of the famous Duc de Saint-Simon;

and although he himself at a later date declared that the influence of Saint-Simon was for evil rather than for good, there is no doubt that during this period of his life he had a great admiration for his patron. Saint-Simon's teeming imagination seems at any rate to have supplied C. with the bases for some, at least, of his later philosophical ideas. In 1824, after a quarrel, C. severed his connection with Saint-Simon entirely. In the following year he married, but the union was not an unqualified success. He now found the greatest difficulty in making a living; he tried to get pupils but failed; he wrote a little for the papers, and finally undertook a course of lectures which would embody the main principles of his philosophy. These were interrupted by an attack of insanity, from which, however, in the course of a few months he recovered. In 1828 the lectures were resumed, and two years later appeared the first vol. of his great work, *Cours de philosophie positive*. Financially, matters had become brighter; he was in possession of a modest income, although he had to work excessively hard for it. Until 1842 things went more or less smoothly, but in that year the temperamental differences between himself and his wife culminated in their separation. By this time also he had lost half his income owing to a gratuitous attack which he had made on the directors of the Ecole Polytechnique, and for some time he lived on the subsidies of friends. In 1842 had appeared the sixth and final vol. of the *Philosophie positive*, and during the pub. of this work he had become friendly with J. S. Mill, who helped him very considerably in his financial difficulties. In 1845 C. fell under the influence of Mme de Vaux, an influence which seems to have been entirely for good, but which, unfortunately, lasted for only a year, being terminated by the lady's death in 1846. In 1851 appeared the first vol. of *Système de politique positive*, the last vol. in 1854. *Catechisme positiviste* was pub. in 1852. During the years 1849-51 C. gave lectures at the Palais Royal, where he strenuously advocated his general theories. He was attacked by cancer in the year 1859, and d. towards the close of that year. See also POSITIVISM; PHILOSOPHY. See L. Lévy-Bruhl, *La Philosophie de Comte*, 1900; M. Wolff, *Le Roman de Comte et de Clotilde de Vaux*, 1929; H. Gouhier, *La Jeunesse de Comte et la formation du positivisme*, 1933.

Comum, see COMO.

Comus (Gk *kōmos*, revel, or a company of revellers), god of festive mirth. He belongs to the later Gk mythology, and is depicted by Philostratus, in the 3rd cent. AD, as a sleeping youth winged, crowned with flowers, and holding a hunting spear and an inverted torch. Milton in his *Comus* represents him as the offspring of Bacchus and Circe endowed with power to turn human faces into those of beasts.

Comyn, Cumming, or Cumyn, Norman family who came to England with Wm the Conqueror. Robert was made earl of Northumberland, his son William becoming chancellor of Scotland. John

Comyn (d. c. 1300), known as the Black C., was a Scottish baron and nephew of the earls of Buchan and Menteith, from the latter of whom he inherited the lordship of Badenoch. He took part in the negotiations between Edward I and the Scots (1289), and was one of the claimants for the Scottish throne on the death of Margaret, the Maid of Norway. He fought, however, for John de Balliol, but in 1296 submitted to Edward I, and came to England. His son *John*, known as the Red C., also fought for Balliol, and was kept as a hostage in England for a time. After the battle of Falkirk he was made guardian of Scotland, and for five years carried on the feud with England. He has become famous on account of his quarrel with Robert Bruce, the origin of which is unknown, but in Jan. 1306 they met at Dumfries, where C. was stabbed to death, whether by Bruce or his followers is not certain.

Conacre (a corruption of corn-acre), obsolete land system once prevalent in Ireland, under which small patches of land were let out for potato growing in lieu of wages.

Conakry, cap. of Fr. W. Africa, situated on the is. of Tumbo at the mouth of the Dubreka, in lat. 9° 30' N. and long. 13° 40' W. It is connected with the mainland by an iron bridge. C. is linked by rail with Kankan, 412 m. It is an important harbour. C. is said to ship 50 per cent. of the bananas consumed in France. There is a radio station. Pop. 75,000 (estimated 1956).

Conca, Sebastiano (1676-1764), It. oil- and fresco-painter, b. Gaeta, who studied under Solimena (q.v.). In his work he was an imitator of Pietro da Cortona, whom he resembled in his superficiality and rapidity. Of his works the 'Sacred Pool of Siloam,' in the hospital of Santa Maria della Scala at Siena, is the best.

Conca, see CUENCA.

Conca D'Oro, see PALERMO.

Concan, see KONKAN.

Concarneau, seaport in the dept of Finistère, France, 14 m. SE. of Quimper. The old tn, which is surrounded by ramparts, is believed to date back to the 14th cent.; it lies on an is. near the bay of La Forêt, while the newer portion, St Croix, is on the opposite shore. It is a centre of the sardine, mackerel, and tunny fisheries. Pop. 10,500.

Concave (Lat. *concavus*, hollowed) and **Convex** (Lat. *convexus*, vaulted) are two opposite terms. As their etymological derivation signifies, the former is applied to a surface falling, the latter to a surface rising, in a circular form. Thus the outer surface of a saucer is convex, the inside concave. In mathematics a curve is convex on the side on which the point of intersection of two tangents falls, and on the other side concave.

Concealment, in the law of contract, means any improper suppression of facts or circumstances by one of the parties to a contract so as to induce the other party to enter into it. In certain contracts, styled contracts *uberrimae fidei* (of the utmost faith), each party must make the

fullest disclosure of all material facts within his knowledge, or the contract will be voidable at the option of the party misled. The remedy for a fraudulent C. is an action to rescind the contract and for damages; for an innocent but material C., rescission only (see CONTRACT). In criminal law, a person knowing of any treason or felony without in any way assenting to it, is guilty of misprision if he conceals his knowledge. Misprision of felony is punishable by fine and imprisonment (see also MISPRISION). Various acts of C. by a bankrupt if fraudulent render the bankrupt liable to certain penalties under the Debtors Act, 1869 (see BANKRUPTCY). C. of treasure trove is punishable by fine and imprisonment. C. of birth is a misdemeanour punishable by imprisonment. C. of documents of title to land or any testamentary instrument is a felony punishable by imprisonment.

Concealment of Birth, see BIRTH.

Conceição do Mato Dentro, tn of Brazil, in the state of Minas Geraes, 75 m. ENE. of Belo Horizonte. It has gold and iron mines. Pop. 3000.

Concentration, in metallurgy, see ORE AND ORE DRESSING.

Concentration Camp, institution of Nazi Germany for the detention of opponents of the Nazi régime. It has been estimated that about 50,000 persons were in the C. Camps at the outbreak of the war in 1939, and that upwards of 200,000 had passed through them in the previous 7 or 8 years. Prisoners in these camps included, besides Jews, Communists, Socialists, Democrats, Catholics, opposition Protestants, Czechs, and indeed even such Nazis as had refused to conform to the party line. Detention in the camps was entirely arbitrary; no person there was ever tried nor was there any legal time-limit to their detention, and indeed most were there for years. Among the worst of these C. Camps were those at Belsen, Buchenwald, Dachau, Auschwitz (qq.v.), Oranienburg, Papenburg, Maideneck, and Treblinka. The prisoners were beaten, forced to hard work far beyond their physical capacity or endurance, and exposed to frightful tortures and humiliations by their guards. There was, moreover, convincing Polish evidence that the camps of Maideneck, Oswiecim (Auschwitz), and Treblinka were torture camps, where the reign of terror and sadism far exceeded all that had been reported from Belsen, Buchenwald, or Dachau. Millions of persons were killed in these camps, the majority slowly tortured to death in the execution of a deliberate policy of mass extermination (see Brit. White Paper of Oct. 1939). The existence of the C. Camps was officially admitted; but they were represented as political reformatories of a rather humane character; on 23 Aug. 1934 Goebbels (q.v.) declared to the delegates of the International Penal and Prison Congress in Berlin that the purpose of the camps was to turn 'anti-social' members of society into 'useful members' by the most humane means. The terror practised in these camps was entrusted exclusively to the Gestapo by

a special law which was promulgated on 12 Feb. 1935, though camps had been in existence for at least 2 years before that date. The unique horror of the C. C.s, and the persistence of that horror for more than 12 years, the more than inhuman cruelty of the terrorists, and the connivance or at least the indifference of a huge public—all these demanded an explanation which in the nature of things was impossible to exact. After the war, sentences were duly passed on the officials who had conducted the C. C.s and on those responsible for their organisation.

Concentric (*con* and *centre*), name which is applied in mathematics to any two or more similar figures which have a common centre. Thus the outer and inner edges of the rim of a wheel form two concentric circles.

Concepción: 1. Prov. of Chile, situated between Nuble prov. in the N. and Biobío, Malleco, and Aruco provs. in the S. Its area is about 2200 sq. m., and there are large and extremely fertile plains. The cap., C., is a port, situated on the r. b. of the R. Biobío, 6 m. from its mouth, and it is the main city of S. Chile, and the third largest in the country. Talcahuano, 8 m. NNW. on the bay of C., is its port. C. has a considerable trade in wine and grain, and manufs. of leather goods, textiles, flour, sugar, metal products, chemicals, and other commodities; it exports coal. The steel plant now being built at Huachipato is expected to increase the economic importance of this area, and in the vicinity are large coal mines. The tn was founded by Pedro de Valdivia in 1550 on a site some 7 m. NNE. In 1730 it was destroyed by an earthquake, and again in 1751. It is now a well-built tn with a fine modern cathedral, law courts, and univ. Pop. (prov.) 411,559; (tn) 119,887.

2. Dept. of the oriental section of Paraguay, lying to the E. of Paraguay R. It is largely low-lying marshland. The cap. of the same name lies on the riv.'s l. b. about 135 m. NNE. of Asunción. A road leads NE. to the Brazilian border. C. has an important trade in *malé* tea. Pop. (dept) 46,500; (tn) 32,500.

Concepción de la Vega, city, cap. of La Vega prov., Dominican Rep., 65 m. NW. of C. Trujillo on the Camú. It was founded by Bartholomew Columbus in 1495. It is a suffragan bishopric and has a fine cathedral. The wooden cross erected by Christopher Columbus and the tree from which it was cut still exist at Santo Cerro 4 m. to the N. C. is linked to the economically important Samaná Bay by rail. Pop. 14,450.

Concepción del Uruguay, city and railway terminus in Entre Ríos prov., cap. of Uruguay dept., Argentina, on the r. b. of the R. Uruguay. It has a national college; its port, 114 m. N. of Buenos Aires, can be used by ocean-going vessels. There is a trade in grain and beef. Pop. 30,900.

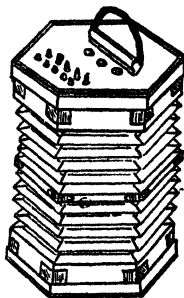
Concept and Conceptualism. *Concept*, a term in philosophy: logical, metaphysical, and psychological. It is the result obtained by the mental process popularly

known as 'abstraction.' We recognise various particular objects which we call 'horses,' and form a general idea, by abstracting certain common qualities from these particulars, of a universal 'horse'; the mind 'affirms' a concept 'horse' by a process of abstracting, combining, and reconstructing 'perceptions': thus 'conception' is contrasted with 'perception.' *Conceptualism* was the scholastic theory, mainly connected with the name of Abélard, which, in attacking the rival theories of Nominalism and Realism, attempted to steer a middle course between the two. The question in debate was as to the nature of genera and species: do they exist in themselves or only in the mind? While the Nominalists held that 'universals,' i.e. genera and species, are only names invented to express the sum of qualities expressed, e.g. by the term 'horse,' and are *post res*, i.e. after things, subsequent, the Realists affirmed that 'universals' have real existence and are antecedent, *ante res*. The conceptualist theory held that they are concepts, existing in the mind, expressing a similarity: they are really existent, but not apart from particular objects to which they apply; or, as Abélard put it, a 'universal' obtains reality by being predicated of something; e.g. there is no reality in the concept 'horse' till you affirm 'Persimmon is a horse.' The rival schools had a great influence in the development of medieval theology. Abélard's conceptualism swayed too much towards the dangerous, materialistic Nominalist school for him to escape the censure of the Church.

Concepts of Law, see JURISPRUDENCE.

Concert, in music, is the collaboration of a number of singers and/or players in giving a public performance. An earlier Eng. word was consort. Concerted music is that written for several voices and/or instruments where each part is of equal importance.

Concert Pitch, see PITCH.



CONCERTINA

Concertina, or Melodeon, is a wind instrument with free reeds. It is composed of 2 hexagonal or rectangular key-boards which are connected by a long, expanding bellows. On the keyboards are rows of knobs which, when pressed,

open valves which admit the air to the free reeds, by whose vibration the sound is formed. The reeds are narrow slips of brass riveted to the inside surface of the keyboard at one end. The outer ends are bent in alternate ways; those bent inwards are actuated by compression, those outwards by suction. The length and thickness of the reeds determine the pitch. The Eng. C. was invented and patented by Sir Charles Wheatstone in 1829; it has a double action, playing the same note on compression and expansion. The Ger. variety, on the other hand, plays two different notes when compressed and then expanded. The C. is made in sev. varieties—treble, tenor, bass, and double bass—the compass of the whole set being 7 octaves. The timbre of the instrument is soft, and capable of delicate gradations. The most prolific composer for C.s was Edward Silas.

Concerto, musical composition written with an orchestral accompaniment, calculated to display the powers of an instrument or a performer. C.s are generally written for a solo instrument, though Bach's C.s for two or more pianofortes, Mozart's for two pianofortes, and Beethoven's for pianoforte, violin, and violoncello, may be cited as exceptions. Early C.s (see CONCERTO GROSSO below) are more suite-like in form, but a modern C. usually consists of three movements, the first in sonata form, the second a slow piece, and the last in rondo, sonata, or variation form. There is usually a cadenza in the first, or sometimes in the last, movement; this is an embellishment or flourish, prepared or improvised, for the solo instrument. Modifications of C. form were introduced by Corelli, Geminiani, Bach, and others; Mozart gave it its modern form, and Beethoven introduced some modifications of this. The romantic composers often treated the C. more freely: Schumann's piano C., for instance, was first conceived as a Fantasy in one movement; Mendelssohn wrote pieces in one and two movements; and Liszt introduced his transformation of themes into the C. Brahms, on the other hand, reverted to the classical form.

Concerto Grosso (lt. 'grand' or 'big concerto'), a musical form preceding the modern concerto (see above) for solo instrument(s) and orchestra. It was in suite rather than sonata form, and sometimes had alternating slow and quick movements, like the church or chamber sonata; but the three movements of the modern concerto, though not their form, were sometimes anticipated. Solo instruments known as the *concertino* (little consort), usually two violins and cello, were already in evidence, but they contrasted with the orchestral (*ripieno*) strings in blocks or layers of sound rather than by brilliant display passages. The whole was invariably supported by a *continuo* part for harpsichord. A great variety of *concertino* instruments was used by Bach in his six Brandenburg Concertos, which still retain the character of the C. G.

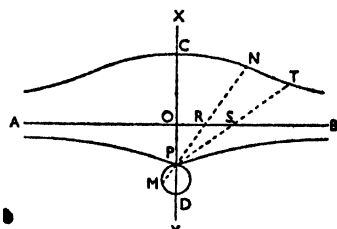
Conch (Gk *kogchē*, mussel or cockle

shell), name applied to various shells, but especially to the fountain shell, a species of gastropod mollusc in the wing-shell family. In art it is represented by a Triton shell, from the allied family Tritonidae.

Conchagua, Bay of, see FONSECA, GULF OF.

Conchifera, term which Lamarck applied to the *Acephales testacea* of Cuvier, together with the Brachiopoda, which forms Cuvier's fifth class of molluscs. The term *Acephala Testacea* has been replaced by *Lameilibranchiata* by modern zoologists.

Conchoid (*kogchē*, shell, *eidos*, form), plane curve invented by Nicomedes, who used it to solve the problem of the duplication of the cube, the trisection of an angle, etc. AB is a fixed straight line and P a fixed point. Equal straight lines



CONCHOID

are drawn through the point P so that they are bisected by the straight line AB, and their ends trace out the two branches of the conchoid. Thus, in the figure, OC = OD = RN = RM = ST = SP. When OD is greater than OP the lower branch forms a loop below P, as in the figure; when OD = OP a cusp is formed at P; when OD is less than OP the lower branch does not reach P. The curve is obviously symmetrical about the straight line XY. The equation of such a curve may be written $(x-b)^2(x^2+y^2)-a^2x^2=0$.

Conchology, branch of zoology which treats of molluscs with reference to their shells. See SHELL.

Conchos, riv. of N. Mexico, which rises in the E. of the Sierra Madre, and, flowing through the state of Chihuahua for about 350 m., joins the Rio Grande del Norte at Ojinaga, opposite Presidio (Texas).

Conciliation, Industrial. Machinery for the settlement of industrial disputes by C. and arbitration has been in operation in various countries for many years. The Conciliation Act of 1896, combined with the Industrial Courts Act, 1919, are the characteristic Brit. form of the system, with its emphasis on voluntary resort to investigation, C., and arbitration by competent tribunals. Such voluntary resort with or without assistance from the gov. has been long estab. in all the well-organised Brit. industries. Trade boards supply a need in those less well organised. At the opposite extreme is the principle

of compulsion. Australia and New Zealand are conspicuous among the countries which have adopted this principle. In Queensland the arbitral tribunal estab. by law has legislative functions, in the sense that its awards have legal effect even in regard to employers and employees who may not have been involved in the dispute which gave rise to the award. C. machinery is now being introduced in the W. Indies and in other Brit. colonies parallel with the development, under official guidance, of trade union principles. Important changes in the machinery of C. have been made by most countries in the past 25 or more years, but no perfect system has yet been evolved. Far more disputes are settled by the voluntary machinery set up by the trade unions and organised employers for purposes of joint consultation than by any other agency; but cases do arise from time to time which call for mediation and where collective bargaining is out of the question. The Act of 1896 did little more than empower the Board of Trade to inquire and report, and it was not until 1911, when the Industrial Council was estab., that any attempt was made to systematise the application of the principle of C. embodied in the Act of 1896. But this body had no power to require disputants to refer to it, the voluntary character of the Act being maintained. In 1919, however, the Standing Industrial Court was estab. under the Industrial Courts Act, consisting of independent persons and representatives of employers and employees, to deal with such disputes as might be referred to it with mutual consent, or to investigate the circumstances if the Ministry of Labour deemed inquiry to be desirable. Neither an award by the court nor the findings of an inquiry were made binding. In its original form the measure contemplated compulsory arbitration and the attachment of trade union funds for strikes against the decisions of the arbitrators. This was necessarily opposed by the unions, with the result that the voluntary tradition subsists. The National Arbitration Tribunal was constituted by the Ministry of Labour and National Service under the Conditions of Employment and National Arbitration Order, 1940, for the purpose of settling trade disputes which cannot otherwise be determined. Many advocates of C. think that almost any system of C. is useful in so far as it promotes investigation. The method of arbitration, on the other hand, leads to the formulation of agreed principles of determining wage questions. In Australia and New Zealand, for example, the system which began last century as a method of averting strikes and lock-outs has developed into one of wage regulation, based on a fairly scientific attempt to ascertain what wages can and ought to be paid. On the whole experience seems to reinforce the traditional Brit. method of voluntary C. and arbitration; but it also tends to strengthen the opinion that, in a state of full employment and labour shortage, and particularly in the 'public service' industries in which breakdown

would disrupt the whole economy, C. and/or arbitration should be compulsory, and that the tribunal should be such as to ensure its permanence. *See also* ARBITRATION, INDUSTRIAL; INDUSTRIAL RELATIONS.

Concini, Concino, see ANCRE.

Conclave (room), name given to the place of assembly when the cardinals of the Rom. Catholic Church meet to elect the pope. The name is also applied to the assembly itself. The regulations for such a meeting were laid down in 1274 by Pope Gregory X, who had suffered from the dilatoriness of election then prevailing. By them it was laid down that after 10 days from the pope's death the cardinals present should assemble in the palace, and should be secluded until they had elected the deceased pope's successor. These regulations are still observed in the main; since most of the popes have d. at Rome the Vatican has been the usual place of the C.

Concord: 1. The cap. of New Hampshire, U.S.A., and co. seat of Merrimack co., on the Merrimack R. It has some fine public buildings, including a state house, built of granite, a state library, and the Rumford Press. There are celebrated white granite quarries, and manufs. of machinery, woollen, cotton, metal, and leather goods, and shoes. Benjamin Thompson (Count Rumford), the statesman and natural philosopher, was a schoolmaster here in 1770-2, and it was the home of Mary Baker Eddy, the discoverer and founder of Christian Science. Pop. 28,000.

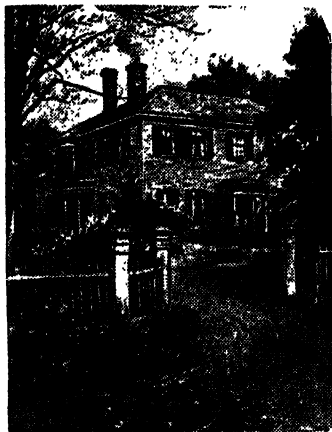
2. The co. seat of Cabarrus co., N. Carolina, on the S. railroad, 18 m. NE. of Charlotte. It has textile mills. Pop. 16,486.

3. Tn in Middlesex co., Massachusetts, on the Concord R., 17 m. NW. of Boston, on the Boston and Maine railroad. The first skirmish in the war of Independence took place here on 19 April 1775, and an obelisk marks the spot where the first Brit. soldiers fell. In C. have lived many notable men of letters, including Emerson, Hawthorne, the Alcotts, and Thoreau. Pop. 8623.

Concord, or Consonance, in music, is a sounding together of notes that satisfy the ear without leading it to expect any further sound to give the impression of finality. The C. which gives the most complete impression of stability is the major triad, with a major third and a perfect fifth above the fundamental note.

Concord, Book of, the 9 Symbolical Books of the Lutheran Church, among which are the Apostles' Creed, the Nicene and Athanasian Creeds. The Lutheran books proper are the Augsburg Confession, drawn up by Luther, Melancthon, Jonas, and Bugenhagen (1530); the Apology for the Confession by Melancthon (1530); the Articles of Schmalkald by Luther (1537); the Smaller and Larger Catechisms of Luther (1529); and the Formula of Concord, drawn up by 6 Lutheran divines (1577). The whole was united by order of Elector Augustus of Saxony and officially recognised as the B. of C. at Dresden on

25 June 1580. The first trans. of the B. of C. into Eng. was made by Ambrose, Socrates Henkel, and others in 1851.



EMERSON'S HOUSE AT CONCORD,
MASSACHUSETTS

Concordance (late Lat. *concordantia*, agreement), name given to a book containing citations of parallel passages in any work, and an alphabetical arrangement of words contained therein, with reference to the passages where they are found. Originally each group of parallel passages was called a concordantia, and the plural form concordantiae used for the collection of such passages, and the Germans still distinguish between C.s of things and C.s of words. The first book to which C.s were made was the Bible; the reason for this was the belief that was formerly held that all parts of the Bible are in harmony with one another, and form one divine whole. Anthony of Padua (1195-1231) is said to have been the author of the earliest C. we have, an anonymous work based on the Vulgate. The first authentic C. was that of Cardinal Hugh of St Cher, a Dominican friar of the middle of the 13th cent.; he is said to have felt the need of such a work for his studies, and to have employed 500 religious to aid him in compiling it. The C.s of Conrad of Halberstadt (fl. c. 1290) and of John of Segovia in the 14th cent. were based on the work of Hugh. The first Hebrew C. was compiled between 1437 and 1445 by Rabbi Mordecai Nathan, and printed at Venice in 1523 by Daniel Bomberg. It was entitled *Meir Nativ* (Light of the Way), and served as the basis for the C. in 4 vols. of Marius de Calasio, a Franciscan friar, dated 1621. The C. of Johann Buxtorf, senior, is only useful to those acquainted with the Massoretic method. C.s of biblical proper names have been pub. by G. Brecker (1876) and Schusselovitz (1878). In 1642

Conrad Kircher of Augsburg produced a C. to the Septuagint, and Abraham Tromm one in 1718. The best modern C. on such lines is that of the Clarendon Press, Oxford, *A Concordance to the Septuagint and the other Greek Versions of the Old Testament, including the Apocryphal Books*. This was pub. in 1897, and a C. of proper names was added in 1900. The first Gk C. to the N.T. is that of Xystus Betuleius (1500-54); other C.s were produced by the Stephenses, father and son, and Erasmus Schmid, a Lutheran divine, whose work forms the basis of most subsequent C.s. A C. of the Gk text with an Eng. version to each word, and the prin. Hebrew roots corresponding to the Gk words of the Septuagint, was produced in 1767 by J. Williams. The first C. of the Eng. version of the N.T. is that of T. Gibson (1535), and the first Eng. C. of the entire Bible was produced by J. Marbeck in 1550. Alexander Cruden's C., which is the basis of all modern C.s, was produced in 1737, with the title, *A Complete Concordance to the Holy Scriptures of the Old and New Testament, to which is added a Concordance to the Works called Apocrypha*. More recent C.s are J. Strong, *The Exhaustive Concordance*, 1890; *The Oxford Cyclopaedic Concordance*, 1910; R. Young, *Analytical Concordance to the Bible*, 1912; D. M. Miller, *The Topical Bible Concordance*, 1947. Since the value of a C. was discovered, the works of many other authors have been furnished with more or less complete C.s, notably Dante, Chaucer, Shakespeare, Milton, Shelley, Browning, and Dickens.

Concordat originally denoted a compact or an agreement. Later it came to mean an agreement between the eccles. and secular authorities. From this usage came the present one: a compact between the pope, as head of the Rom. Catholic Church, and a temporal sovereign, having for its object the regulation of eccles. affairs within the dominion of the sovereign. A C. may take any one of three forms. The pope may consult with the gov. with which the C. is to be drawn up, and then issue a papal bull to regulate the affairs of the Rom. Catholic Church in that country; the contents of the bull are incorporated by the gov. in the law of the land. Another method is for two identical acts to be drawn up: the pope signs one of these, and the sovereign the other. The third and most common is a formal treaty drawn up after consultation, signed by plenipotentiaries on both sides, and ratified by the high contracting parties. Such a method was adopted in the Fr. C. of 1801. A C. is concerned with such matters as Church property, eccles. appointments, the rights of the clergy, regulation of public worship, etc. Various views are held as to the binding force of a C. Some secular jurists have held that it can be annulled at will by the State; some favourable to the absolute authority of the pope have declared it to have no binding power on him. The general view is that, like any other contract, a C. is binding on both the signatories, with the proviso that no gov. can guarantee that it will be

accepted by the next gov. in office. See **STATE OR ESTABLISHED CHURCH**.

Concorde, Place de la, famous open square in Paris, beside the Seine and the garden of the Tuileries. It was originally named after Louis XV, who planned it. During the Revolution its name was changed to Place de la Révolution, and it was here that Louis XVI, Marie-Antoinette, Charlotte Corday, Danton, Robespierre (q.v.), and numerous others were guillotined. An obelisk from Thebes stands in the centre.

Concordia, Rom. goddess of harmony and peace, to whom many temples were raised. The earliest was that of Camillus, on the Capitol (367 BC), celebrating the reconciliation of the patricians and the plebs by the Licinian laws. The Senate frequently met here, and here Cicero delivered his oration against Catiline. C. is represented on coins as a matron, holding in her left hand the cornucopia, and in her right an olive branch.

Concordia: 1. City and riv. port of Entre Ríos prov., Argentina, on the Uruguay R.; virtually the limit for seagoing vessels. It has vegetable oil, confectionery, and other industries, and saw mills, tanneries, flour mills, etc. The chief exports are cereals, citrus fruits, and *malt*. There are fine public buildings; the famous Rivadavia park is on the outskirts, 3 m. away. Pop. 51,600.

2. Or **Concordia Sagittaria**, It. tn, in Veneto (q.v.), 34 m. N.E. of Venice (q.v.). It has a fine cathedral.

Concrete, in grammar, term opposed to abstract, denoting a thing as opposed to a quality. Thus a sweet taste is C., sweetness is abstract; red as a colour is C., redness is abstract. However, some logicians place adjectives apart as attributes.

Concrete, building material composed of a cement (q.v.) which will enter into chemical combination with water forming a solid, mixed with definite proportions of sand and broken stone or other aggregates. The cement as it hardens binds these together, forming an artificial stone which can be moulded to any required shape, and will set and harden even under water.

History. C. as known to-day is a result of the discovery by J. Aspidin in the year 1824 of the material he called Portland C. because when set it resembled Portland stone in colour. Forms of C. were known to the ancients, but the binding materials they used were clays, or mortars made with lime or pozzolana, some of which had the property of setting under water. Most of these ancient materials, including that used by the Romans, would nowadays be called lime mortars, and Rom. cement, differing but little from that used by the Romans, was used in the manuf. of C. up to about the middle of the last century. What is called C. to-day is made with a variety of Portland cement or high-alumina cement, which sets in water.

Properties. Strength, durability, and watertightness are the properties generally required of C., and these properties depend upon the following factors: (1) the quality and properties of the materials

used; (2) the proportion of cement in the finished C.; within limits, the higher this proportion, the stronger is the C.; (3) the strength of the cement paste; the wetter the mixture the weaker the C. so long as the proportion of cement is not altered; (4) the even distribution throughout the mixture of different sized particles of aggregate and of the cement paste; (5) thorough compaction to produce maximum density; the lower the density of C. the weaker it will be; and (6) drying out slowly, and protection against frost and heat and drying winds during the hardening period. The reasons for these requirements, and methods of meeting them, are discussed in the following.

Aggregates. The main requirement of the material to be added to cement to form C. is that it must be clean and inert. C. cannot be stronger, more durable or weatherproof than the materials with which it is made. If C. is to be strong and durable to keep out the weather, and to be fire-resistant, it must be made of materials that have these properties. If C. is to be light in weight, a lightweight aggregate must be used. If C. is wanted that will reduce the passage through it of heat and cold, an aggregate and mixture that will produce a C. with this special property must be used. In constructional work the requirements are strength, durability, and watertightness. These properties are present in gravel and sand, and, because these materials are found in most parts of the country and can be cheaply obtained, they are used for most C. work. Crushed hard stone is satisfactory. C. made with these materials weighs about 140 lb. per cub. ft. The aggregate must be clean. If it is coated with clay or loam or other foreign matter the cement cannot bind the pieces together, because it will adhere to the layer of foreign matter instead of to the surface of the aggregate.

Lightweight Concrete. If lightweight C. is the primary consideration, then clinker furnace ashes, pumice, or foamed slag may be used. Lightweight C.s are not waterproof, and must be rendered if they are used for external walls. If C. is to be resistant to the passage of heat it is best to use a porous aggregate (such as clinker and foamed slag) and to use this aggregate in a C. that is not solid—that is, by omitting some of the fine material. Pockets of air are highly resistant to the transmission of heat from one face to another, and, generally, the greater the proportion of voids in C. the greater its insulating properties. These C.s are weaker than gravel C. Aerated or 'cellular' C. has a high insulating value. This class of C. can be made to weigh as little as 18 lb. per cub. ft., but has very low strength. Sawdust and wood-wool are also used to make lightweight and insulating C., usually in precast slabs.

Size of Aggregate. The maximum size of the aggregate depends on the work in which it is to be used. For foundations or heavy work it may be up to 3 in. in size. For road work 1½ in. is commonly used. Generally, however in reinforced

C. structures, all the aggregate should pass through a sieve with $\frac{1}{2}$ -in. meshes, or meshes $\frac{1}{2}$ in. less in size than the distance between the most closely spaced bars, whichever is the smaller. In thin walls the largest particles of aggregate should not exceed one-fifth of the thickness of the C.

Grading of Aggregate. If C. is to be strong, watertight, and durable it must be dense. A cub. ft. of solid stone weighs about 160 lb. When it is in the form of coarse aggregate it weighs about 100 lb., so that more than one-third is voids. The cheapest material with which to fill these voids is smaller stones, and there must be smaller and still smaller particles to fill the spaces between all the sizes larger than the smallest. The more carefully an aggregate is graded the stronger a C. will be if all other processes are the same. The ideal aggregate is one comprising all sizes from the largest to the smallest in the proportions that produce greatest density, and this can best be obtained by dividing the aggregate into two sizes, the coarse and the fine. Coarse aggregate is all the material retained on a sieve with $\frac{1}{2}$ -in. meshes. Fine aggregate is the material that will pass through a $\frac{1}{2}$ -in. sieve, with any excess of dust removed. If the coarse and fine materials are both properly graded, then a suitable aggregate is produced by mixing them together in the proportions of about 2 parts of the coarse aggregate to 1 part of the fine aggregate, because the fine material is more than sufficient to fill the voids in the coarse. Fine aggregate is sometimes screened out and only the coarse material, say that between $\frac{1}{2}$ in. and $\frac{1}{4}$ in., used, with the object of providing a 'no-fines' that will have insulating value owing to the presence of voids.

Proportions of Materials. So long as the materials, workmanship, and manufacturing processes are the same, the strength of C. depends upon the quantity and the strength of the cement paste it contains. By proportioning is meant the selection of the quantities of cement and aggregate to be used in a C. or, more frequently, the quantities of cement, fine aggregate, and coarse aggregate to produce a C. of a required strength.

When aggregates are separated into fine and coarse, and then mixed together in the proportions that will give greatest density, the combined bulk will be little, if any, greater than the bulk of the coarse aggregate alone, because most of the fine aggregate will fit in between the pieces of coarse aggregate. Thus a mixture comprising 1 part of cement to 6 parts of all-in mixed aggregate (a 1:6 mixture) will contain less cement than a mixture comprising 1 part of cement, 2 parts of fine aggregate, and 4 parts of coarse aggregate (a 1:2:4 mixture); in the 1:2:4 mixture most of the fine material will fit into the spaces between the coarse aggregate, so that the mixture will, in fact, be 1 part of cement to 4 to 5 parts of combined or 'all-in' aggregate.

For ordinary work, C. in the proportions of 1 part cement, 2 parts fine aggregate,

and 4 parts coarse aggregate (or 1 part cement to 4 to 5 parts 'all-in' aggregate) is suitable. For work that must be watertight, or where extra strength is required, the mixture should be 1 part cement, $1\frac{1}{2}$ parts fine aggregate, and 3 parts coarse aggregate (or 1 part cement to 3 to $3\frac{1}{2}$ parts of 'all-in' aggregate). For work of minor importance a mixture of 1 part cement to 3 parts fine aggregate and 6 parts coarse aggregate (or 1 part cement to 6 to $7\frac{1}{2}$ parts 'all-in' aggregate) is sufficient.

Strength of Concrete. In ordinary good-class C. the following strengths may be expected. The figures are crushing strengths 28 days after placing C. made with ordinary Portland cement, ballast, and sand: 1:1:2 mixture, 4500 lb. per sq. in.; 1:1:3 mixture, 3750 lb. per sq. in.; 1:2:4 mixture, 3000 lb. per sq. in. Where special precautions are taken to control the quality of C. these strengths can be considerably exceeded, and strengths of 8000 and 10,000 lb. per sq. in. are fairly easily obtained.

Water Content. Cement will not begin its chemical action of setting and hardening until it is wetted, and $1\frac{1}{2}$ hrs or so after water is added the setting process becomes noticeable. The water combines with the cement and makes a paste which coats the particles of aggregate and binds them together. The amount of water determines the strength of the cement paste and therefore of the C. so long as the same amount of cement is used. If the quantity of cement remains the same, the more water that is added the weaker becomes the cement paste and the weaker the finished C. If more water must be added to make the C. workable enough for the work in hand, then more cement must be added to keep up the strength of the cement paste if the strength of the C. is to be maintained.

Too little water will also make a weak C. because it may not be sufficient to enable the chemical action of the setting of the cement to proceed properly, for setting only goes on while the cement is moist, and stops as soon as the C. dries out. A good rule to follow is to use no more water than is necessary to enable the C. to be placed and compacted. A good average C. is obtained by the use of 6 gallons of water to a bag (112 lb.) of cement. Porous aggregates, such as broken brick, pumice, and foamed slag, absorb some of the mixing water, and this must be allowed for by soaking the aggregates before they are mixed.

Mixing. If the materials are mixed by hand the aggregate should first be measured and spread out on a clean mixing platform and the cement spread on top. The coarse material should be spread out first, followed by the fine material, and then the cement on top. After the materials have been mixed dry until the colour is uniform they should be shovelled to the shape of a saucer so as to retain water, and the water poured into the middle. The materials and water are then mixed by shovelling from the side to the middle, and then turning over the heap to a different part of the platform

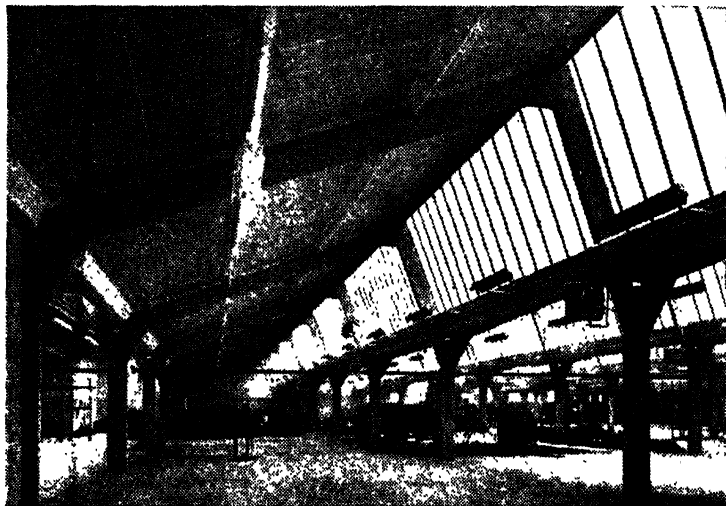
and back again until the water is evenly distributed.

Machine mixing is more efficient and cheaper than hand mixing, such machines generally being in the form of steel drums rotated by power. In machine mixing it is not necessary first to mix the materials in the dry state. Very small machines are fed by filling the dry materials into the drum by shovel; larger machines are charged by means of a skip or from an overhead bin. The water is added when the dry materials are in the drum. All

C. The drum is emptied by running the C. down a chute into a hopper or on to a platform.

Placing in Position. If the site for a floor or road slab is muddy, hardcore should be rolled on to it to make a level surface, or 3 in. of lean C. (say 1:10) laid over it before the structural C. is placed. The site must also be brought to an even surface, as irregularities will cause variations in the thickness of the slab.

The depth of C. placed in each layer or 'lift' in walls and columns depends



The Cement and Concrete Association

FACTORY AT BRACKNELL NEW TOWN, BERKS

An example of reinforced concrete framing

except the smallest mixers are fitted with tanks with a ball-cock or other device which enables the correct quantity of water to be added to the batch.

Continuous mixers have a separate hopper for cement and aggregates which are taken by Archimedean screws to the mixing compartment, from whence the mixed C. is discharged through a spout in a continuous flow. The size and rate of rotation of the screws determine the quantity of each material carried into the mixing compartment, and thus automatically proportion the mixture.

A recent innovation in Britain is the supply of ready-mixed C. At a central depot the dry materials are filled into a mixing drum mounted on a lorry chassis and the water is filled into a tank over the drum. As the lorry, known as a 'truck mixer,' approaches the site the driver empties the water into the drum and causes the drum to rotate and mix the

upon its consistency and the strength of the shuttering. Very stiff C. should be placed in lifts of 4 in. to 6 in. Wetter mixes may be placed in lifts of 2 ft or 3 ft so long as they can be properly consolidated. Wet C. exerts a side pressure similar to water, and it is probably true to say that most collapses of shuttering have been due to placing wet C. at too rapid a rate; when C. is placed in small lifts the lower lifts have time to harden, or partly harden, and the pressure on the shuttering is reduced before fresh lifts are placed. Each lift of C. should be the same depth throughout the work and the C. should be spread evenly in the shutters.

Consolidation. Each lift must be consolidated and worked well into the layer below. In the case of stiff mixes, heavy rammers should be used. A piece of wood, or a reinforcement bar with the bottom bent at right-angles, is a useful tamping tool in confined spaces. For

road and floor slabs, 6 in. by 3 in. timbers with handles fitted at each end may be used by two men, one on each side of the slab. Tamping must be continued until air bubbles cease to escape and a film of moisture appears on the surface; it is then discontinued. Excessive trowelling or tamping brings neat cement and water to the surface, and this will set as a skin which will flake off if it is on a floor subjected to traffic, or crack if it is on a surface subjected to changes of temp. Excessive trowelling of wet C. is the commonest cause of 'dusty' floors.

Consolidation can be assisted by hammering the shuttering with a mallet, the vibration thus set up helping the pieces of stone to slip into place and also helping to produce a smooth face. Vibrating machines for consolidating C. are of three types, namely: (1) vibrators for attachment to the outside of the shuttering; (2) vibrators which are pushed into the C.; and (3) plate vibrators which are placed on the C. so that the vibrations are imparted in a downward direction; these are generally used for floor and road slabs.

Construction Joints. When concreting is stopped for more than an hour, a stop-board must be used to keep the edge vertical and the C. well tamped up to the board. Any scum must be removed before more C. is placed, and the new C. thoroughly tamped against that already in position. If the work has to be left until the older C. is hard, then the surface must be hacked to form a key for the new C. After hacking, a wire brush should be used to remove dust and loose material, the old surface thoroughly wetted and brushed over with a very thin coating of mortar mixed in the proportions of 1 part of cement to 2 parts of sand, and the fresh C. then placed. This applies to all cases where new C. is bonded to old.

Concreting under Water. When C. is placed under water a tremie is used. This is a pipe with a funnel at the top and a valve at the bottom, and is sufficiently long for the funnel to be above water when the bottom of the pipe is resting on the bed of the sea or riv. The C. is fed into the funnel, and the pipe is raised as the level of the C. rises. Care must be taken to keep the pipe full of C. in order to prevent water from entering. If there is much movement of the water, such as occurs in a flowing stream, it is necessary to provide a coffer-dam so that the work can be done in the dry.

Gunite. C. may also be placed by a cement gun. In this process C. is 'shot' on to an existing structure. The materials are mixed dry and fed to a hose through which they are forced by compressed air. When the dry materials reach the nozzle, water is added by a jet. Owing to the force with which it impinges against the surface to be treated, gunite is very dense and waterproof, and is mostly used for repairing or strengthening structures built of C., brick, or other material.

Hardening. If C. is to harden properly it should remain moist and warm until it has gained the greater part of its ultimate

strength. For normal purposes this period can be taken as seven days with ordinary Portland cement, four days with rapid-hardening Portland cement, and twenty-four hours with high-alumina cement. During these periods the C. must be protected against drying winds, hot sunshine, and extreme cold. C. should not be placed when the temp. is below 40° F. unless precautions are taken to prevent the C. falling below that temp. When the temp. does not fall below 30° F., the addition of 2 lb. of calcium chloride per cwt of cement expedites setting.

Surface Finish. There are two main trends in the treatment of C. surfaces. One is to produce a surface that will need no, or very little, finishing after the shuttering is stripped, and the other is painting, rendering, brushing, or bush-hammering. Shuttering for the production of smooth surfaces should be of steel or plywood. The C. must be thoroughly spaded against the shuttering in order that the face of the C. shall be as free as possible from holes due to entrapped air and water pockets. If a smoother surface is required the C. can be rubbed with carborundum bricks or power-operated carborundum disks after the face has been made good. Ordinary oil paint is not suitable for use on C., because it is affected by the free lime in the cement. Paints specially made for the purpose are available in a variety of hues. Coloured and white C.s are made with aggregates and cement of the desired colour. Generally the aggregate is crushed natural stone, and this is used with cement of the same colour.

When C. is tamped or vibrated a skin of cement and fine material is brought to the surface and the face of the work has the appearance of neat cement. If this skin is removed the aggregate will be seen on the face. To make the aggregate visible on the face of the work is the object of 'exposed aggregate' finishes. The methods usually adopted are scrubbing and hammering. In the scrubbing process the best results are obtained if the shutters can be stripped within 48 hrs, or at any rate before the cement is too hard to be brushed off. The scrubbing is done with a wire brush, using plenty of water, until the surface skin of cement is removed. If a hammer is used the work is best done when the C. is hard. For unimportant work C. surfaces can be improved by hammering off the skin and projections, filling holes with mortar, and giving the whole surface a brush coat of grout mixed in the proportions of 1 part of Portland cement to 3 parts of sand.

Floor Surfaces. Hard-wearing floor surfaces, known as granolithic, are toppings 1 in. to 2 in. thick of a dense concrete made with crushed granite or other aggregate with a high resistance to abrasion. The usual method of hardening a C. surface is to apply a solution of 1 part of silicate of soda to 4 parts of water. The solution must be copiously brushed on with a soft broom, and three applications at intervals of twenty-four hrs are desirable. The simplest way to make a non-slip

C. surface is to form grooves in it or roughen it with a brush before it hardens. Another method is to sprinkle carborundum powder on the surface before it is hard, or iron filings may be mixed with the top in. or so of C.

Precast Concrete. C. products are made separately in moulds. Almost every part of a building that is commonly made in wood or stone can be made in C., from members weighing many tons such as sectional bridges and blocks for harbour wharves to roofing tiles, as well as C. poles and posts, paving flags and kerbs, manholes, stairs and steps, and so on. Steel and wood are generally used for the moulds, but plaster piece-moulds and gelatine moulds are used for ornamental work. Power machines are used for the mass production of wall-blocks, paving flags, kerbs, roofing tiles, and other common C. products. *See also* REINFORCED CONCRETE. *See J.* Singleton-Green, *Concrete Engineering*, 1933-5; A. C. Davis, *Portland Cement*, 1934; W. H. Glanville (ed.), *Modern Concrete Construction*, 1939; H. L. Childe, *Concrete Products and Cast Stone*, 1940; F. M. Lea and C. H. Desch, *The Chemistry of Cement and Concrete*, 1956.

Concretion, nodular mass of calcareous, siliceous, or ferruginous material deposited in rocks or soils by circulating waters. Flints are among the commonest types of C.

Concubinage. Cohabitation of a man with a concubine is a very ancient custom. Among the Greeks married men were allowed to have concubines; the position of the latter was not utterly despised, and their children had some status, if recognised by their father. The Roman law, too, recognised concubines; their position was in many cases respectable, but Augustus, to encourage regular marriages, passed the Lex Julia and the Lex Papia Poppaea, which enacted that only women of low rank should be chosen as concubines. The children of concubines were not legitimate, but were called natural, and their right of inheritance was very limited, though they were rendered legitimate if their parents afterwards married. In the O.T. times C. was permitted as a relief from a barren marriage, and was extensively practised. Christianity did not permit such irregular unions, and Constantine the Great was the author of legislation intended to check the practice. It is common in Muslim and Asiatic countries, and was extensively practised in the New World, where plantation owners commonly kept Negro slave concubines. *See* HAREM.

Concussion of the Brain, form of shock where the injury received has shaken the brain and reduced the patient to a state of stupor, without producing any apparent structural damage to the brain. Any severe blow on the head will cause concussion; the symptoms are complete unconsciousness, with pallid, cold skin and feeble pulse. This condition continues for a length of time varying with the severity of the shock received from a few minutes to a few hours, when the pulse becomes stronger and consciousness

returns. Though the recovery from concussion is usually complete, such symptoms as loss of memory and headache may remain for some time. There is always complete loss of memory for events immediately preceding the accident. The patient should be put to bed as quickly as possible with hot-water bottles, and should then be left undisturbed. No stimulants should be given unless specially ordered by the doctor in charge; and during the period of recovery all excitement is to be avoided.

Condamine, C. M. de la, *see* LA CONDAMINE.

Condé, Henry I de Bourbon, Duc d'Enghien, Prince de (1552-88), son of Louis I, a Fr. Huguenot leader; he fought for Henry of Navarre under Coligny. To save his life after the massacre of St Bartholomew he embraced the Catholic faith, but on the death of Charles IX he recanted and went to Germany, where he raised an army and joined Alençon, 1575. Eventually he was taken prisoner and d. from the effects of poison alleged to have been given him by his wife, Catherine de la Tremouille.

Condé, Henry II de Bourbon, Duc d'Enghien, Prince de (1588-1646), son of Henry I and father of the 'Great C.'. He was a Catholic, and fought zealously against the Protestants, becoming one of Richelieu's most faithful supporters. He was made president of the Council of Regency when Louis XIII d., 1643, and his second son, Armand, was founder of the house of Conti.

Condé, Louis I de Bourbon, Prince de (1530-69), fifth son of Charles de Bourbon, Duke of Vendôme, and younger brother of Antoine, King of Navarre. He was the first to bear the famous title, and had a distinguished military career under Marshal de Brissac in Piedmont, at Metz while Charles V was besieging it, and in the battle of St Quentin. A supporter of the Huguenots, he was one of the leaders in the conspiracy of Amboise, designed to remove Francis II from the Guise influence and make him acknowledge the Huguenot faith, and only the death of Francis saved his life. On the accession of Charles IX, Catherine de' Medici made him governor of Picardy. In 1562 he took command of the Huguenot army, against the Guises and was captured at Dreux, but released again by the treaty of Amboise, 1563. When renewed fighting broke out C. again led the Protestants, but after the battle of Jarnac he surrendered, and was shot.

Condé, Louis II de Bourbon, Prince de (1621-86), the 'Great C.', Fr. soldier, b. in Paris. He defeated the Spaniards at Rocroi in 1643, the Bavarians at Freiburg, 1644, and at Nördlingen in 1645, and took Dunkirk for the Fr. in 1646. In 1646 he succeeded to his father's estates and title, and since he had married Richelieu's niece in 1641, this made him one of the most powerful figures in the realm. He at first took the side of the Court against the Fronde, and brought back the young Louis XIV to Paris in 1649. He considered himself ill-treated by Mazarin,

however, and put himself at the head of the faction of the *Petits Maitres*; he was captured and imprisoned by Mazarin in 1650. After a year the union of the old and new Frondeurs brought about his release, and he marched upon Paris as the rebel leader and fought an indecisive battle in the suburb St Antoine. Many of his adherents then left him, and he joined the Spaniards, who appointed him generalissimo of the Sp. armies. He fought for the Spaniards at Arras in 1654, Valenciennes in 1656, and Cambrai in 1657. He was defeated at the battle of the Dunes by Turenne in 1658, but was restored to his rank in France by the peace of the Pyrenees in 1659. He conquered Franche-Comté, afterwards fought the Dutch at Seneffe, 1674, defeating the Prince of Orange (afterwards William III of England), and in the following year drove Montemarli out of Alsace. Four years later he retired to Chantilly.



LOUIS I DE BOURBON, PRINCE DE CONDE

Condé, Louis Antoine Henri de Bourbon, see ENGHIEU, DUC D'.

Condé, Louis Joseph de Bourbon, Prince de (1736-1818). Fr. soldier, son of Louis Henry, Duke of Bourbon (1692-1740). He was for some time governor of Burgundy and, when the revolution broke out, commanded the 'army of Condé' for the king, joining the Austrians until the peace of Campo Formio in 1797. He fought for the Tsar of Russia, afterwards going to Bavaria in the pay of England. In 1800 he settled at Malinesbury in England, but returned to France on the restoration of Louis XVIII. He was the author of an *Essai sur la vie du grand Condé*, 1798.

Condé-Smendou, com. in the arron. of Constantine, Algiers. It is noted for its wines. Pop. 17,000.

Condé-sur-l'Escaut, Fr. tn in the dept of Nord, at the confluence of the Scheldt and the Hayne. It was formerly a stronghold, and has the 15th-cent. château of the princes of Condé (q.v.), who took their name from this place. There is coal mining. Claire Clairon (q.v.) was b. here. Pop. 7100.

Condé-sur-Noireau, Fr. tn in the dept of Calvados, at the confluence of the Noireau and the Druance. There are cotton industries. The tn was very badly damaged during the battle of Normandy (1944). Pop. 3400.

Condensation, see GAS AND GASES; STEAM.

Condenser, apparatus for condensing steam or other vapour into the liquid form by introducing cold water into the vapour, or by passing the vapour through cold water. See STEAM ENGINE and TURBINES for the various forms of C.

Condenser, Electrical, see CAPACITOR; ELECTRO-STATICS; INDUCTION, ELECTRO-STATIC.

Condensing Engines, see STEAM ENGINES.

Conder, Charles (1868-1909), artist, b. London, son of a civil engineer, educated in England; went to Australia when 17, worked on the *Illustrated Sydney News*, but in 1890 returned to Europe and studied art in Paris. He attracted attention with his painting 'The Hot Wind,' 1890, and settled in London in 1894. He developed an original decorative style, especially in water colours on panels of white silk, Watteau-like designs for fans, and charming pastoral scenes. See J. Rothenstein, *The Life and Death of Conder*, 1938.

Conder, Claude Reignier (1848-1910), colonel, Royal Engineers, and explorer, b. Cheltenham. He studied in Italy, also at the University College, London, and the Royal Military Academy, Woolwich. He became head of the survey party at Nablus, Samaria (1872), and took charge of the survey of Palestine (1872-8 and 1881-2), his *Memoirs* of which were brought out in 7 vols. by the Palestine Exploration Fund in 1880. This work is of great value to the student of the O.T. and N.T. hist. In 1882 he was attached to the Egyptian expedition under Garnet Wolseley, and took part in the battles of Kassassin and Tel-el-Kebir. He worked in the ordnance survey of Plymouth (1887-94) and in the W. of Ireland till 1905. C. pub. many scholarly works on archaeological and philological subjects. These include *Tent Work in Palestine*, 1878; *Syrian Stone Lorc*, 1886; *Ataic Hieroglyphs and Hittite Inscriptions*, 1887; *The Tell Amarna Tablets*, 1893; *The First Bible*, 1902; and *The City of Jerusalem*, 1909.

Condillac, Etienne Bonnot de (1714-1780), Fr. philosopher, b. Grenoble. He spent practically all his life on his estate of Flux, near Beaugency, engaged in philosophical studies, and d. there. His first notable work appeared in 1746, the *Essai sur l'origine des connaissances humaines*. This work, in conjunction with his *Traité des systèmes* (1749),

outlines his theory. He explained almost everything by the law of association of ideas, and whilst allied to the principles of Locke, he disagreed with those of Descartes, Spinoza, Malebranche, etc. Sensation, according to him, is the only possible source of knowledge, and all intellectual processes may be traced back to sensation. The clearness and perspicacity of his writings obtained for him the post of instructor to the infant duke of Parma, for whom he wrote seven instructional works which form seventeen vols. of the complete works of C., pub. in 1798. C.'s philosophical writings have been ed. by G. Le Roy, 1947. See Z. Q. Schaupp, *The Naturalism of Condillac*, 1926.

Condiments (Lat. *condire*, to season or pickle), any substances of pronounced flavour used as seasoning agents, to give relish to food or stimulate the appetite. Many C. are essential. Among the chief are salt, vinegar, olive oil, sugar, and aromatic or pungent C., such as spices, mustard, pickles, pepper, and ginger.

Condition. In the law of contract (q.v.) the non-fulfilment of a C. *precedent* by one of the parties disentitles him from enforcing the contract against the other party. By a C. *precedent* is meant some act to be performed or some contingency to be fulfilled or some time to elapse before one party can be called on to carry out his part of the contract. For example, if A agrees in writing to sell his business to B, and they verbally agree that the transfer shall be subject to the consent of A's partner, A cannot be forced to sell until A's partner does consent. C.s may also be *concurrent*, i.e. each party must perform his agreement at the same time. For example, A agrees to buy a slate quarry from B, and B agrees to purchase all slate from A: A cannot sue B for not taking slate unless he can show that he was ready to buy the quarry or had bought it. Sometimes the parties to a contract introduce a provision that the occurrence of an event shall discharge them mutually from further liabilities, e.g. that the happening of an excepted risk of a charter-party shall discharge the ship-owner from liability for failure to carry a cargo. Such provision is known as a C. *subsequent*. It is entirely a matter of construction whether representations or alleged verbal stipulations in any particular can amount to C.s. Not every representation made prior to a contract can be called a C. Whether it be a C. depends on whether the court comes to the conclusion that such statement or representation was the *condition on which the other party contracted*. C.s must be distinguished from warranties. A warranty is part of the contract itself, whereas a C. is something collateral to it. A breach of warranty only entitles the injured party to damages; the breach of a C. entitles the injured party to repudiate altogether. But the Sale of Goods Act, 1893, expressly provides that in certain cases C.s shall be implied in a sale which, if unfulfilled, shall entitle the buyer to repudiate. (As to these see SALE.)

Conditional Immortality, or Annihilationism, the doctrine that the immortality of the soul depends on faith and union with Jesus Christ. Its adherents maintain that the Bible teaches immortality as something to be hoped for, and as a future gift of God. They are thus opposed both to Universalism (the doctrine that all, even the devil, will ultimately be saved) and to belief in eternal punishment. Everlasting destruction or annihilation is considered to be the fate of the wicked. In 1878 the C. I. Mission was founded for propaganda in the Brit. Is. See also IMMORTALITY. See E. White, *The Life of Christ*, 1875; S. D. McConnell, *Evolution of Immortality*, 1901.

Conditioned Reflex, term introduced by the celebrated Russian physiologist I. P. Pavlov, to describe certain kinds of acquired automatic behaviour, the investigation of which has thrown much light upon the activities of the brain. Pavlov noticed that the flow of saliva, for instance, which is normally caused by the taste of food in the mouth, can equally well be caused by some new event that occurs at or about the same time as the taking of food (as it can be by the sight of food). The flow of saliva at the sight of food is a *conditioned reflex*. Pavlov showed by experiment that flow of saliva could be induced in a dog by the mere ringing of a bell, the ringing of which had for sev. previous occasions been followed shortly afterwards by the appearance of food. The importance of a study of C. R.s is that it enables us to understand better some forms of learned behaviour which may be C. R.s. As an aid to the analysis of behaviour the artificially produced C. R. is of value, and it has been used in experimental psychology. See I. P. Pavlov, *Conditioned Reflexes*, trans. by Auer, 1927.

Condom, Fr. *tn*, cap. of an arron., in the dept of Gers, on a hill above the Baise. It was formerly the seat of a bishopric once held by Bossuet (q.v.). It has a trade in brandy, wine, grain, and cattle. Pop. 6700.

Condonation, in law, the conditional forgiveness by one spouse of an offence which the other spouse has committed in breach of the marriage vow. The condition is that the party if forgiven will not repeat the offence. C. may be either expressed in writing or implied by conduct. It is a complete bar to proceedings for divorce so long as the condition remains unbroken.

Condor (from Peruvian *cuntur*), *Vultur gryphus*, large S. Amer. vulture, found particularly in the region of the Andes, especially in the higher regions, where it makes its nest at a height of from 10,000 to 15,000 ft. The general colour is black, and in both sexes there is round the lower part of the neck a white ruff of feathers. Above this the head and neck are bare. The C. feeds on flesh, to obtain which, in default of carrion, it will attack small or aged animals. It is the largest bird capable of flight, having a wing span of 12 ft or more.

'Condor,' Brit. gunboat, which was

commanded by Lord Charles Beresford (then captain) at the bombardment of Alexandria in 1882. Another *C.* of the R.N. went down with all hands near Honolulu in 1901.

Condor Vine, *see* CONDURANGO.



Condorcet, Marie Jean Antoine Nicolas Caritat, Marquis de (1743-94), Fr. sociological and mathematical writer, *b.* at Ribemont, near St Quentin, of a very ant. family. He was educated at the college of Navarre, and distinguished himself especially in mathematics. He wrote in 1764 his *Essai sur le calcul intégral*, and in 1767 his *Mémoire sur le problème des trois points*. These works, afterwards pub. together under the title of *Essais d'analyse*, and dedicated to the Academy of Sciences, procured for him in 1769 the distinction of a seat in that institution. The facility with which *C.* treated the most difficult mathematical studies was remarkable, and until 1792 his output was large, as, in addition to the works already mentioned, he contributed frequently to the transactions of the learned societies of St Petersburg, Berlin, Bologna, Turin, and Paris. His *Eloges des académiciens morts avant 1699*, 1773, was immensely popular, and gained for him in 1773 the honour of being made permanent secretary to the Academy of Sciences. He won the prize offered by the Academy of Berlin in 1777 by his theory of comets, and because of his acquaintance with D'Alembert he wrote many articles for the *Encyclopédie*. He was not elected a member of the Fr. Academy until 1782, owing to the aversion which was felt for him by Maurepas. When the Fr. Revolution broke out he sided with the people, and was elected deputy to the legislative assembly of Paris. He was soon appointed secretary, and in Feb. 1792 was made president. The legislative assembly was merged in

the national convention in Sept. 1792, and *C.* was there in sympathy as a rule with the Girondist party. He was in favour of the punishment of Louis, but not of his death, as he believed in the abolition of capital punishment. On the fall of the Girondist party he attacked the new constitution, was denounced at the Bar on 8 July, and later accused of being an accomplice of Brissot. He was protected by Mme Verney for eight months; but, learning that she was in danger of death for harbouring him, he fled from Paris, and was recognised and arrested at Clamat. He was found dead in his cell, having probably taken poison, which he always carried about with him. His best-known work was written whilst he was with Mme Verney, *Esquisse d'un tableau historique des progrès de l'esprit humain*, 1794. *C.* was a free-thinker, and had a high standard of virtue. In both his public and private life he was blameless; his application of the problems of philosophy to mundane affairs and the betterment of social conditions is the distinguishing feature of his polemical works. *C.*'s complete works were edited by M. F. Arago and A. Condorcet-O'Connor (12 vols., 1847-9); his correspondence with Turgot by C. Henry, 1882. *See* J. F. E. Robinet, *Condorcet*, 1893.

Condottieri (It. 'leaders'), name given to the captains of those bands of soldiers which overran Italy and held the military power there from the 13th to 15th cents. They were composed of professional fighting-men who would serve under anyone who held out prospects of plunder, the idle riff-raff of the country, and criminals fleeing from justice, with a proportion of men who had lost their all in the wars. Naturally with such ingredients the chief objective of the armies was always plunder; it was immaterial to the combatants which of the contending govs. gained the victory. After some time the *C.* became heads of organised bodies of men, and sev. attained much power and position. Francesco Sforza, for example, became duke of Milan (1450). Other famous *C.* were Francesco di Carmagnola (q.v.) and Sir John Hawkwood (q.v.), an Englishman.

Condrieu, Fr. tn in the dept of Rhône, on the Rhône. It produces good wines, and fruit. Pop. 2400.

Conductance, in an electric circuit on d.c., the inverse of resistance, on a.c., the ratio of resistance to (impedance)², measured in *mho* (*see* ADMITTANCE). The *C.* of a conductor is always taken as the inverse of resistance and is directly proportional to the cross section *S*, inversely proportional to length *l*, written $\sigma S/l$ where σ is a material constant—the conductivity.

Conducting, in music, is the art of directing orchestral and choral performances, where the interpretative intentions have of necessity to be left to the will and the skill of one single person. Fundamentally a conductor's task is to beat time in order to keep the performers together, but apart from that he has to see to it that the composer's indications, conveyed to the performers by notation,

are carried out faithfully, that the different parts balance and blend satisfactorily where notation alone cannot achieve this, and that his own ideas of interpretation are reconciled with the composer's intentions. The great conductor is he who effects this reconciliation in such a way as to secure a satisfactory artistic result; neither the more time-beater nor the capricious or selfishly wilful showman is capable of serving the art of music properly. A good conductor must have studied the music beforehand, so as to be thoroughly familiar with the score; he must realise the technical possibilities of the voices and instruments under his command and be able to bring out the best that is in them; above all he must have a good ear and interpretative talent. He has to rehearse his performers beforehand, separately and together, so that they become familiar both with the music and with his methods and intentions. C. of some sort goes back to the church choirs of the 15th cent., if not earlier, when the choirmaster beat time with a roll of music-paper. The orchestra (including opera) was conducted up to the 18th cent. by the *continuo* player at the harpsichord (called *maestro al cembalo*) or by the leader of the violins. The idea of interpretative C. is first clearly seen in the Mannheim School under Stamitz during the first half of that cent. C. with a baton began about the turn of the 19th cent. Many composers have conducted their own works, but they have rarely been great conductors, and creative genius is not essential to good C. See Adam Carse, *Orchestral Conducting*, 1929; Hermann Scherchen, *Handbook on Conducting*, 1933; Sir Adrian Boult, *A Handbook on the Technique of Conducting*, 1940; Fred. Goldbeck, *The Perfect Conductor*, 1951; D. E. Inghelbrecht, *The Conductor's World*, 1953.

Conduction of Electricity, transfer of electricity through matter. In metals C. is due to a flow of electrons (q.v.) from points at low potential to points at higher potential. The electrons are derived from the atoms of the material, and the atoms take no part in the movement. Metals contain many 'free' electrons that move with little hindrance from the parent atoms, and they are therefore good conductors. In the other solids the electrons are more tightly bound to the atoms and C. is less. Increase of temp. in this case frees more electrons, so the conductivity of non-metals increases with rising temp., C. in gases and in many liquids involves a flow not merely of electrons, but of atoms or groups of atoms as well. When a salt, sodium chloride for example, is dissolved in water the chlorine atoms each gain an electron and become negatively charged, while the sodium atoms each lose one and become positively charged. These charged atoms, or ions, can move through the liquid and transport electricity (see **ELECTROLYSIS**). Gases are, under normal circumstances, almost completely non-conducting. They may be 'ionized' by irradiation with X-rays or by radioactive radiations. They are more readily

maintained in a conducting state at high temps., as in the electric arc, or at low pressures, as in electric discharge lamps. (See **ELECTRIC DISCHARGES**; **VALVES**; **SEMICONDUCTORS**.) At very low temps. certain metals such as lead become almost perfect conductors, and if a current is set up in a ring of a metal in this superconducting state the current persists for a long time without any energy being supplied. In all other cases the flow of a current through a conductor is accompanied by a loss of energy as heat, and a continuous supply of energy is required to maintain the current. A magnetic field (see **MAGNETISM**) is always present in the space around a conductor in which a current is flowing.

Conduction of Heat. Heat may be transferred in three ways: by radiation, by convection, and by C. (See **HEAT**.) C. differs from convection in that the flow of heat is unaccompanied by a flow of matter, as when a poker that is heated at one end in a fire becomes warm at the other end. It may occur in gases or in liquids, but is of more importance in solids. Metals are good conductors of heat, and owe their high thermal conductivities to the presence of free electrons, so the best conductors of electricity are also the best conductors of heat. Good conductors are essential for such articles as steam boilers, domestic cooking utensils, etc., while poor conductors are required for house walls, furniture, and clothing, where it is desirable to limit the transfer of heat. The thermal conductivities of air and other gases are low, so porous and fibrous substances such as felt, asbestos, and woollen materials serve as relatively good insulators of heat on account of the high proportion of air contained in their interstices.

Conductivity, of an electrical conductor material, is the inverse of resistivity or specific resistance, measured in *mho/cm*. See **CONDUCTANCE**; **RESISTANCE**.

Conductors, Electric, substances which conduct electricity; also the overhead lines which carry the current in a transmission or distribution system. Overhead C. must have sufficient mechanical strength to hang freely in a fairly long span (900 ft in the Brit. Grid) without undue sag, to save in the number of pylons, and sufficient conductance (q.v.) to carry full load current without undue heat loss or rise of temp., which would increase sag and accelerate corrosion. Copper has a higher conductance for a given cross-section, aluminium has a higher conductance for a given weight. Increased mechanical strength is obtained by composite C. In steel-cored aluminium C., a steel core (usually stranded) is covered by strands of aluminium of sufficient aggregate cross-section to carry the current. The conductance of the steel is neglected. In copper-clad steel a steel core is covered with a layer of copper, having been dipped in molten copper which adheres to and partly diffuses into, the steel, a further layer being added by rolling. The conductance of this composite conductor is measured and

expressed as 'equivalent copper cross-section.' The increased overall cross-section of both composite C. is of advantage with respect to skin-effect (q.v.) and corona (q.v.) loss. See CONDUCTANCE; TRANSMISSION, ELECTRIC POWER.

Condurango, or **Cundurango**, name applied to sev. species of Asclepiadaceae found in S. America, but especially to the plant *Marsdenia C.* (condor vine). The bark yields a drug used as a remedy for snake-bites and chronic dyspepsia.

Condyle, rounded eminence in a bone which serves to articulate it with another bone. Such structures occur in the femur, the humerus, the jaw, and the occipital bone.

Condyloma (plural, condylomata), wart-like growth or tumour near the genital organs or the anus. It may be pointed or, in the case of syphilitic C., broad, flat, and moist.

Condylura Cristata, genus and species of the New World moles, is an insectivorous mammal of the family Talpidae. The animal is about 7 in. long, 2½ in. being taken up by the tail, whence the name long-tailed condylure; at the end of the snout there is a curious radiating structure from which the creature is sometimes called the star-nosed mole. The fur is a deep lustrous brown above, lighter beneath; in habit the condylure is a burrowing animal, and its diet consists of worms, insects, and their larvae.

Cone, surface generated by a straight line which passes through a fixed point and is intercepted by the circumference of a fixed curve. The moving straight line is called the generator, the fixed point the vertex, and the fixed curve the directrix. The term is also applied to the space enclosed by the curved surface and the fixed curve, and often refers to a right circular C., which is defined by Euclid as the solid figure formed by the revolution of a right-angled triangle about one of the sides containing the right angle. The side about which the triangle revolves becomes the axis of the C., and its length becomes the altitude; the circle described by the other side containing the right angle becomes the base. An oblique C. is one in which the base is not at right angles to the axis. Some of the characteristics of a conical surface are: All planes tangential to the curved surface pass through the vertex; the curved surface is 'developable,' that is, it can be unrolled to form a plane, or conversely, this plane surface can be wrapped round the same C. without rupture or wrinkling. The curved surface when unrolled becomes a sector of a circle whose radius is the slant height of the C. Its area is one-half the slant height multiplied by the perimeter of the base. The volume of a C. is one-third that of a cylinder with the same base and height; therefore it may be measured by multiplying one-third of the height by the area of the base, the area of the base being πr^2 , where r = the radius of the base. Similar C.s are those in which the axes and the diameters of the bases are proportionals. A truncated C. is formed when the upper part containing the vertex is

cut away by a plane parallel to the base. In machinery the term C. is applied to a truncated surface tending to converge to a point. See also CONIC SECTIONS.

Conegliano, **Giambattista da**, see CIMA. **Conegliano**, It. tn. in Veneto (q.v.), 15 m. N. of Treviso (q.v.). It has a 14th-cent. cathedral, and a castle. The surrounding hills are covered with vineyards, and the tn has an institute for the study of wine production. Pop. 16,000.

Coney (Lat. *cuniculus*) means a rabbit, but the word is now used only in legal phraseology and as a trade term for rabbit fur. The C. mentioned in the O.T. is probably the damian, *Hyrax syriacus* (see HYRAX). In Elizabethan times the word meant simpleton or dupe, and a coney-catcher was a confidence-man or sharper.

Coney Island forms part of the bor. of Brooklyn, New York city. It stands at the entrance of New York harbour, on the S. shore of Long Is. It is 6 m. long, its greatest breadth being three-quarters of a m. It has a fine beach, and is a very popular summer resort. The coming of the subway extension in 1920 made it a public playground for New York's millions. It is divided into sev. dists.—W. Brighton, Brighton, Sea Gate, and Manhattan Beach. There are sev. bathing pavilions, and the boardwalk is 2 m. long. (See illustration, p. 704.)

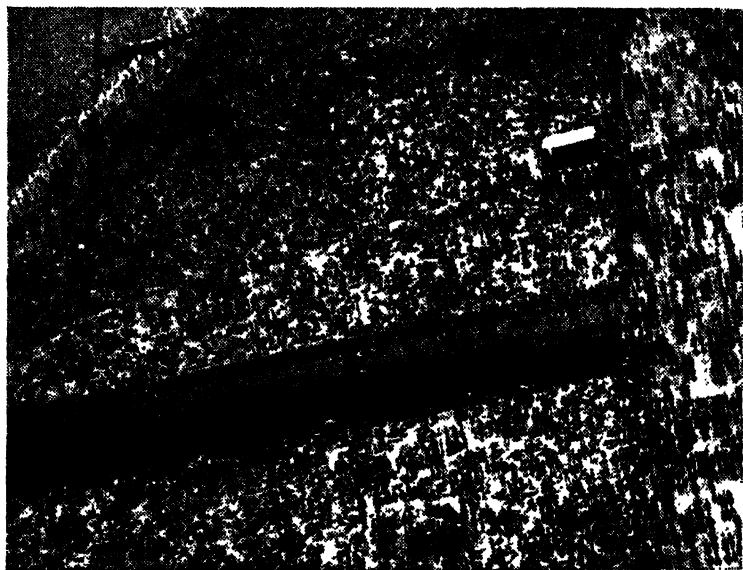
Confarreatio was 1 of the 3 Rom. forms of marriage. It was the only one which was invested with the sanctity of a religious performance; an offering was given to Jupiter, and bread made of spelt (*panis farreus*) was eaten. The priest spoke certain sacred words over the couple in the presence of 10 witnesses. C. is supposed to have been confined to the patricians, and certain offices in the state could only be held by persons whose parents had been so married.

Confectionery (Lat. *confectio*, a preparation, from *conficere*, to make up). C. is of two kinds, (1) sugar C. and (2) flour C. Sugar C. means sweets in which sugar is the main ingredient. Either they consist of sugar in very fine crystal form dispersed in a sugar solution and flavoured, i.e. chocolate *crèmes*, fondants, etc., or there may be sugar maintained in a solution of a careful blend of the different types of sugar, i.e. boiled sweets, toffees, caramels, etc. Fats, milk, nuts, etc. are employed to obtain a variety of forms. Before the 19th cent. sweets and candies were the monopoly of apothecaries, who made them to hide the taste of their drugs. Sweets were at first made by hand, but by the middle of the 19th cent. machinery was introduced for many of the operations, such as mixing and rolling. Flour C. consists of pastries and fancy cakes having as their basis flour but sweetened and mixed with various dairy products such as butter, eggs, etc. These, although now being made more and more on a large scale, are usually made by bakers at local shops. See also COCOA AND CHOCOLATE.

Confederate States, name adopted by those S. states of the N. Amer. Union which seceded and formed an independent union at the end of 1860 and beginning of

1861. The name stressed the profounder cause of the Amer. Civil war, which was to see their rise and extinction. It was for the vindication of state rights against the Federal Gov. of the N. (see CONFEDERATION) that the S. states seceded, though the vital issue was the question of slavery. The 11 C. S. were, in order of secession, S. Carolina, Mississippi, Florida, Alabama, Georgia, Louisiana, Texas, Virginia, Arkansas, Tennessee, N. Carolina, the first in Dec. 1860, the last in May 1861. The president was Jefferson Davis (q.v.); the

insists on the individual independence of each state or society in a common union, while federation insists on the supremacy of the common gov. Thus the Brit. Commonwealth, as at present constituted, is a C., as was the Ger. C. estab. at the Congress of Vienna, 1815. The distinction is well illustrated by the Ger. terms *Bundesstaat*, a bond of states or federal state, and *Staatesbund*, a states bond or C. The Amer. Civil war was fought not only on the slavery question but also on the profounder question



Sid and Ben Ross

PART OF CONEY ISLAND BEACH IN SUMMER
There are over 10,000 people in this photograph

vice-president Alexander H. Stephens; and the secretary of state Judah P. Benjamin. The seat of the gov. was at Richmond. The constitution, adopted on 11 Mar. 1861, based on the U.S.A. constitution, varied in freer independence to the separate states, in the right of the Cabinet to seats in the two Houses of Congress, in the prohibition of protective tariffs or bounties, and in the avowed upholding of the institution of slavery and rights of property in slaves. The inherent weakness of the C. S. lay in their numbers, about half of those of the N. states, in railways, and in finance; and, moreover, they were crippled by the overwhelming naval superiority of their antagonists. The brilliant military capacity of their generals alone kept the war going as long as it did. See UNITED STATES, *History*.

Confederation, political term, contrasted with or opposed to federation, for a form of union of individual states or societies. It

whether the union should be confederate or federate. The term C. has been used in constitutions which embodied the principle of subordination of a general gov. to regional govts. Thus it was used in the Articles of Confederation of 1777 (United States); in the Union of Utrecht (constitution of United Netherlands); in the constitutions of Switzerland from earliest times; of Germany from 1815 to 1867; of the N. Ger. C. of 1867 to 1871; and of the Ger. Empire from 1871 to 1918. It was adopted by the seceding states in America when they called themselves the Confederate States of America. But immediately after styling themselves 'the people of the Confederate States' they declared that their object was to form a permanent federal gov. The terms are treated as interchangeable in the Swiss Constitution of 1874, which is headed 'Constitution fédérale de la Confédération Suisse.' The authors of *The Federalist*

itself did not distinguish between the two terms, although they distinguished between the two principles involved. To increase the confusion the Canadian Constitution, which when it is not federal is unitary, describes the gov. it sets up as a C. But if the use of the term C. is linked with the principles of the Articles of Confederation of 1777 and of the Confederate States and of the Ger. C.s, its meaning may be kept distinct. See also *FEDERATION*. See K. C. Wheare, *Federal Government*, 1946.

Confederation of the Rhine, name given to the union of the states which seceded from the Ger. empire in 1806, and were placed under Fr. protection. Napoleon adopted the title of protector of the C. of the R., which had its cap. at Frankfurt. Its members included Saxony, Württemberg, and Bavaria, and sev. lesser states. The confederacy at the time of its greatest power extended over a space of 125,000 sq. m., with 14,600,000 inhab.; after Napoleon's Russian campaign (1812) the power of the C. declined, and the whole structure fell to pieces, 1813.

Conférence, L'île de la, see *FAISANS*.

Confession, in law. If the accused at his trial volunteers an unqualified C., that is conclusive evidence against him, but in trials on a capital charge he is generally advised to withdraw such a C. and plead not guilty. A C. made elsewhere than before a judge or on summary proceedings before justices may be conclusive, but is only admissible in evidence where proved to have been made freely and voluntarily; and a C. is not free and voluntary if made as a result of some improper threat or inducement of a temporal nature held out by a person in authority, such as a committing magistrate, a police constable, or the prosecutor. The accused's master would not be a person in authority unless the offence was committed against him. A C. following on a statement by a person in authority to the accused that he need say nothing to incriminate himself, but that anything he might say would be used against him, is admissible in evidence. A sacramental C. to a priest would probably be privileged from disclosure. Although a C. may be inadmissible, any facts discovered thereby, and so much of the C. as relates to those facts, are admissible. In arraignment, if the accused pleads guilty no further proof or trial is necessary, and the court proceeds to judgment on his 'own confession.'

Confession, or more specifically **Auricular Confession**, is the disclosure of sins to a priest of the Church for the purpose of obtaining absolution. The practice was ordained by the early Catholic Church of a public C. of three mortal sins; these were murder, idolatry, and adultery. About the time of Pope Leo I (440-61) the list of mortal sins was extended so as to include all crimes which under the Rom. law were punishable by death, exile, or severe corporal punishment. We should note, however, that there was a distinction between C. in itself to a priest and the public *exomologesis*, or penitential discipline for crimes. By the fourth General

Lateran Council of 1215 it was laid down that it was the duty of every faithful member of the Church who had reached years of discretion to confess his or her sins to the priest at least once a year. This is still binding upon Rom. Catholics. The great difference between the ant and the modern C. is that formerly great sins were to be confessed publicly and publicly atoned for, whereas now much emphasis is laid on the seal of secrecy. C. is practised by the Rom. Catholic, the Gk, and all oriental churches, and also by an Anglican section.

Confession and Avoidance, in the language of pleading, means an *admission* by one party of the facts alleged against him by the other party, coupled with counter-allegations of fresh facts going to show either some justification or excuse, or a discharge or release, so as to *avoid* the legal effect of the admission. A plea in C. and A. may be used either in the defence to a statement of claim or in the plaintiff's reply to a counterclaim. A party pleading in C. and A. is not thereby prevented from putting in a separate plea called a traverse denying the facts confessed.

Confession of Augsburg, see *AUGSBURG*, *CONFESSION OF*; *CONFESSION OF FAITH*.

Confession of Faith, reasoned statement of the religious beliefs and doctrines of a particular Church or body. The ant Christian C.s of F. are more usually called *creeds*, under which heading they are treated. Modern confessions begin more or less with the Reformation, when the leading Protestant reforming bodies formulated their doctrines. The first of these is the Confession of Augsburg, 1530, drawn up by Melancthon and revised by Luther, who desired to define his position not only towards the Rom. Catholics, but also towards the followers of Zwingli. This was presented to Charles V, who had summoned the diet of Augsburg to offer a fair hearing to all the religious parties of the empire. It expounded in plain teaching the doctrine of God and of the Son of God; of original sin and of justification; it also dealt with the marriage of the clergy, invocation of saints, the celebration of the eucharist, and rejected, among other things, the doctrine of transubstantiation. An answer to the confession from the Rom. Catholic Church evoked Melancthon's Apology, which was presented to the emperor but not received. Both the confession and the apology were pub. in 1531. The Articles of Schmalkald were drawn up by Luther in 1536, the Confession of Württemberg in 1552, and the Formula of Concord in 1580; together with the Augsburg Confession they formed the body of the Lutheran C. of F. A separate confession (the *Confessio Tetrapolitana*), Zwinglian in tendency, was presented at Augsburg by Strassburg, Constance, Lindau, and Memmingen; but the Zwinglian position was more clearly defined by the Confession of Basle, 1534, and the First Helvetic Confession, 1536. Calvinism was formulated in 1559 by the Gallican Confession, presented to Francis II and Charles IX. The Second Helvetic Confession, strongly Calvinistic, revised

in 1564, was accepted widely in Switzerland, Hungary, France, and Scotland as an authoritative statement of the doctrines of the reformed Churches. In England Henry VIII held a convocation in 1536, at which ten articles were drawn up aiming at a compromise between the old and new theology. In 1538 a conference was held at Lambeth with envoys from the Lutherans; thirteen articles were formulated, but the Catholic reaction followed with the Statute of the Six Articles, 1539. In 1549 Cranmer required all preachers to subscribe to the Articles of Religion, chiefly drawn up by himself. In 1552 they were revised, and as the Forty-two Articles held the ground till their revision as the Thirty-nine Articles of the Church of England, 1563, by Archbishop Parker and Guest, bishop of Rochester; the final revision was in 1571. In 1647 the Westminster Confession, strongly Calvinistic, with predestination as its main characteristic, was drawn up. The clergy of the Eng. Church withdrew, and the Independents took little share in it. It was Presbyterian throughout. It was sanctioned by the Scottish parliament in 1649, and enforced throughout the U.K. The Baptists issued a Vindication of the Truth as a formulary of their teaching, they having been excluded from the conference which drew up the Westminster Confession. The latter, with the larger and shorter catechisms, has, with modifications, remained the confession of English-speaking Presbyterians (see PRESBYTERIANISM and SCOTLAND, CHURCH OF). In 1673 Robert Barclay issued a statement or Apology embodying the faith of the Society of Friends. In 1833 the Congregational Union pub. a confession which was prepared by Dr George Redford, not as a confession in the strict sense, but as embodying general principles.

Confessional: 1. Place for hearing confession of penitents. They are so designed as to protect the penitent from publicity and embarrassment, and the priest from scandal or obloquy.

2. The term is also given to the burial-places of martyrs (who had 'confessed' Christ) and to the places of their tombs beneath the high altars of churches, e.g. the C. (or Confession) in St Peter's, St Mary Major's, and other Rom. basilicas, which are sunken areas before and beneath the High Altar.

Confidentiality. Eng. law recognises that in the interests of justice there are occasions when certain communications, written or oral, should be regarded as confidential and therefore privileged from the requirement of being given in evidence in court proceedings. Communications between husband and wife are always privileged. Communications made in self-protection are equally privileged, e.g. a warning given by a master to his workmen not to associate with a former fellow workman dismissed for dishonesty. Communications as to affairs of state or official communications between public officers on public affairs cannot be disclosed without the consent of the head of the dept concerned. The C. of com-

munications with legal advisers extends to all statements or documents concerning matters made the subject of professional intercourse; but communications made in furtherance of a common unlawful design are not privileged. The compulsory disclosure or discovery of documents after action commences is no real exception to the rule of C., such discovery being based on the principle that if the party makes the documents part of his case they must come out sooner or later; and their purport ought, in ordinary fairness, to be divulged to the other party, that he may know what case he has to meet. Medical men may be compelled to disclose communications made to them even though imparted in professional confidence; and the rule of privilege probably does not extend to communications made to clergymen; but judges have evinced a disinclination to enforce disclosure. In this latter respect Eng. law differs from that of Rom. Catholic countries and the U.S.A. In Scots law confessions made by a prisoner to obtain spiritual advice and comfort are, but confidential communications to clergymen in the ordinary course of their duty are not, privileged. A broad distinction must be noted between statements made in answer to confidential inquiries and those merely volunteered. The latter would only be protected if it were the duty of the person making the statement to volunteer the information contained in it: for the law does not protect idle gossip. Generally it may be said that where a confidential relationship exists, e.g. as between master and servant, brother and sister, employer and employee, or perhaps intimate friends, there is a mutual duty to volunteer information on anything which each of them ought to know. But where there is no confidential relationship volunteered statements are not often privileged.

Confirmation (Lat. *confirmare*, to strengthen), the sequel to baptism (q.v.), consisting of the invocation of the Holy Ghost as comforter and strengthener, and the laying on of hands (q.v.) by a bishop, to impart the sevenfold gifts of the Spirit. In the Rom. Catholic and Eastern Orthodox Churches it is always accompanied by the anointing with oil. In the former it is normally administered by a bishop, in the latter by a priest, though always with oil (chrism) consecrated by a bishop. In the Rom. Catholic Church it is administered, in the W., usually after the age of discretion, i.e. after about 7 years of age, when a child can discern between right and wrong; in the Lutheran Church between the ages of 13 and 16 years; and in the Church of England usually between 14 and 18 years of age, though the Prayer Book only specifies the age of discretion. In the primitive Church baptism and C. were administered immediately one after another, followed by Holy Communion, even in the case of infants, and this is still the practice in the oriental Church. The Rom. Catholic and Eastern Orthodox Churches teach that C. is a sacrament. Protestant Churches generally have abandoned it with episcopacy, substituting an

admission to adult membership of the Congregation. The Anglican Church has tended to waver between these two views (see SACRAMENT); but the High Church and moderate parties accept the sacramental view of C. as conferring a special indwelling of the Holy Ghost, and this is the more common teaching found in the Church of England to-day.

Confirmation. In Scots law the nomination or appointment of an executor is not sufficient authority for him to administer a deceased person's estate. He must obtain from the sheriff a decree authorising him to act. This decree and the document in which it is issued are known as C. In effect it is equivalent to the Eng. probate or letters of administration.

Confiscation (Lat. *fiscus*, the treasury), in its literal signification, means forfeiture of property to the Treasury, as, for example, in Rom. law the *Lex Julia* punished violence without arms by C. of a third of the offender's property. In Eng. law C. of property, generally known as forfeiture, followed on conviction for felony (see CRIMINAL LAW); but the Forfeiture Act, 1870, abolished forfeiture for felony, although in certain cases the accused may be condemned to pay compensation up to £100. The expropriation of neutral ships carrying contraband of war (see DECLARATION OF LONDON) is practically the only other kind of C. now known either to municipal or to international law.

Conflict of Laws, or Private International Law, the body of recognised principles for deciding cases where the private or local law of different nations is in conflict. Private International Law, or, to use Prof. Dicey's phrase, C. of L., consists of the rules acted upon by courts of justice in determining (1) the limits of their own jurisdiction in disputes relating to foreign transactions; and (2) the appropriate law, whether local or foreign, to be applied in a case which is within their jurisdiction. Most civilised countries concur, for example, in deciding cases on contract according to the law of the land where the contract was made. The question whether the courts of one country are guided by courtesy or by legal principle in applying foreign law to the decision of particular cases has given rise to much academic controversy, owing to the truism that the courts of one country cannot be legally compelled to respect alien legal principles. See COMITY.

Confoocal, having the same foci. In geometry, a conic or conic section may be regarded as the curve formed by the intersection of a cone by a plane, or as the locus of a point whose distances from a fixed point called the focus and a fixed line called the directrix form a constant ratio, called the eccentricity. If conics have the same foci they are termed C. If an ellipse and a hyperbola have each the same two foci, they intersect at right angles.

Confolens, Fr. tn, cap. of an arron., in the dept. of Charente, at the confluence of the Vienne and the Goire. It has

interesting old buildings, including a ruined 12th-cent. château. Flour is manuf., and there is a market. Pop. 2900.

Conformable Strata are beds which rest upon one another in a regular manner, the bedding planes being parallel throughout. This shows that no strong earth movements took place between the deposition of successive strata, and the formation is conformable because continuous and uninterrupted. When, however, land is raised out of the water, denudation takes place, and should those strata become again submerged and new deposits arise, then the bedding would not, as a general rule, be conformable. See UNCONFORMITY.

Confucius (551-479 BC), Chinese sage, b. Ch'ueh-fu, in the state of Lu. His family name was K'ung, personal name, Ch'iu, and courtesy-name Chung-ni; his clan being an offshoot of the state of the dukes of Sung. In C.'s 3rd year his father, who had been a soldier of distinction and valour, died, leaving his second wife, who was C.'s mother, ill provided for. The name C. is a Latinised form of K'ung Fū-tzu, the Master K'ung. In 532 C. married, a son, Li, and 2 daughters being the fruits of this marriage. In the following year he began to teach in his native state Ch'ueh, having occupied the interval as a subordinate official in charge of public herds and stores. Between 531 and 517 he paid a visit to the cap. at Loh, where it is thought he may have met the great teacher Lao-tzu. In the latter year he took refuge in the neighbouring state of Ch'i, for Lu was the scene of civil strife in which the reigning Duke Chao suffered defeat. On the death of this ruler in the year 510, Ting became duke in his stead, and when in 501 he appointed C. governor of the city of Chungtu he found that he had done an excellent service alike for his own house and for his subjects, for C., who was rapidly promoted to the Ministry of Works and later of Crimes, became at once the idol of the people and the practical reformer of many outstanding abuses. Gov. grew strong; men grew loyal, and women gentle. Immorality and corruption both vanished, and from far and wide men came to see a model state. But petty jealousies undermined his success, and a crafty gift to the duke of some beautiful dancing girls led indirectly to a rift between the latter and his counsellor. Accordingly in the year 497 C. set out on his wanderings, which were destined to last till 483. With a little band of faithful disciples he travelled from state to state and court to court, settling always where there seemed most chance of freedom from persecution. Friends and believers in his word were not lacking, yet it was no uncommon thing for his company to be in actual want and even in peril of their lives. At length there came a message to the teacher in Wei from the 10-year-old Duke Ai, who had succeeded Ting, bidding him return to his native place, which he accordingly did. It is improbable that he made any effort to pick up the threads of his old political life. Rather he devoted

his last years to literature, to the collection and exposition of the anc't writings, and especially to the piecing together of his *Ch'un Chiu* which recounts the annals of Lu from 722 to 479 BC, and to which a peculiarly high interest was attached in the past as the only classical work of this greatest of Chinese sages. But to gain any insight into C.'s personality, it is necessary to turn to the many memorabilia compiled by his disciples, for the Confucian analects were collected shortly after his death, and give a true picture of what the Master said and did. They should, therefore, be carefully distinguished from that mass of legendary and apocryphal literature that later grew up round the name of C. as round that of every great religious teacher. And first of all it seems clear from the analects that, unlike other men of equal influence, C. was careful to disclaim any special communion with God. Indeed his conversation was rarely of the nature of divinity or heaven, and his answers to such questions, as 'What becomes of man after death?' or 'What is the meaning of sacrifice to the spirits of the dead?' were always enigmatic or evasive. So deficient are his sayings in the fervour of the piety of a Francis of Assisi or in the belief in human progress and in a great social regeneration to come, that many regard Confucianism rather as a system of ethics than as a religion. Yet in the days of his misfortunes and exile he was supported by a belief in the reality of his mission as a preacher of the truth. He said once to his followers fearful for his safety: 'After the death of King Wên, was not the cause of the right way lodged in me? While Heaven doth not wish this cause to perish, what can the people of K'wang do for me?' Further, he is said to have remarked of himself at the age of 70 that he 'could do whatever his heart prompted, without transgressing what was right.' But he has himself told posterity how he liked best to imagine his life's work. Once a disciple was non-plussed when a certain ruler asked him to describe his Master. 'Why did you not tell him,' said C., 'that I am a man who in his eager pursuit of knowledge forgets his food, and in the joy of its attainment forgets his sorrows, and who does not perceive that old age is coming on?' Thus he would have men picture him as a philosopher eager in the search of truth, but it was always in the truth of this world, that is of the just relationship between man and man, rather than the truth of the Unseen and of what all sceptics regard as the Unknowable. 'While you cannot serve men,' he once argued, 'how can you serve spirits?' But the practical nature of his teaching is best realised in his emphatic assertion of the golden rule: 'What you do not like when done to yourself do not do to others.' It seems that he stated it only thus, that is, in its negative form, but his writings make it clear that he also appreciated its worth in its positive and higher form: in one passage he regrets bitterly that he had not taken the initiative in obeying it. The formulation of

this axiom of conduct illustrates his sympathetic knowledge of human nature—a knowledge that further illuminates the countless epigrams and sententious maxims upon which it is no exaggeration to say has grown the fabric of Chinese morality. Scattered up and down throughout all the Chinese classics they have upheld the standard of right conduct to which every good citizen tries to conform. Here are a few of his sayings: 'A poor man who does not flatter, and a rich man who is not proud, are passable characters; but they are not equal to the poor who yet love the rules of propriety.' 'What the superior man seeks is in himself; what the small seeks is in others.' 'A man can enlarge his principles; principles do not enlarge the man.' 'In style all that is required is that it convey the meaning.' 'Learning undigested by thought is labour lost; thought unassisted by learning is perilous.'

C. devoted most of his time to the preservation and 'transmission', as he put it, of anc't literature, rituals, and music, which he considered essential for the advancement of civilisation and good gov. Before his time those who wanted to learn had to go to court archives which, due to constant civil wars, were rapidly being destroyed, and only scions of noble families were privileged to do so. C., as the first founder of a private academy or univ., declared that 'in education there should be no class discrimination'; thus he took the right of education and of being educ. from the hands of the privileged class and made it possible for the poor and obscure as well as the rich and noble to avail themselves of the opportunity of learning. His insistence on principle and virtue rather on mere learning enabled many of his disciples to become advisers to kings and dukes in many states. Shortly after the estab. of his academy many rival schools were founded by other sages, but the fact that only his school has fl. throughout succeeding ages proves the soundness of his teaching, which has not only bound the Chinese nation as a cultural entity, but has also dominated the culture of China's neighbours such as Japan, Korea and Indo-China, where up to the last century Confucian Classics formed the main part of national education. See also CHINESE LITERATURE. There is a trans. of the *Analects* by A. Waley, 1938. See E. Chavannes, *Lés Mémoires historiques*, vol. v, ch. 47, for life of C.; see also R. F. Johnston, *Confucianism and Modern China*, 1934; Lin Yutang (ed.), *The Wisdom of Confucius*, 1939; M. Collis, *The First Holy One*, 1948; A. Doebelin, *Confucius*, 1948; H. G. Creel, *Confucius: the Man and the Myth*, 1951.

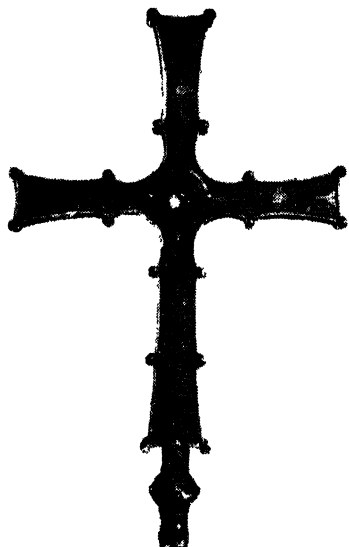
Confusion, Circle of, see CIRCLE OF CONFUSION.

Cong, Cross of, one of the chief treasures of the National Museum of Ireland, see DUBLIN. It is probably 12th cent. metalwork and was originally made as a reliquary for a fragment of the True Cross.

Congé d'Elire (in Anglo-Fr. *conge de eslire*) means leave to elect, and is applied

in England to the warrant or licence from the Crown to the dean and chapter of a cathedral, authorising them to elect a bishop or archbishop, as the case may be, to a vacant see.

Conger Eel (*Conger*), muscular, voracious fish of the family Congridae. In colour it is usually whitish below and a dark blue-grey above, whilst its length varies from 3 to even 10 ft. It has no pelvic fins or scales, but its dorsal fin is continuous and stretches very far forward. These eels have wide mouths, sharp, closely packed teeth, and free tongues, and though their flesh is coarse are quite edible. They are widely distributed over the temperate and tropical seas.



Copyright National Museum, Dublin

THE CROSS OF CONG

Congestion, localised excess of blood in the arteries, veins, or capillaries. It is to be distinguished from plethora, or general excess of blood. C., or hyperaemia, may be classified as arterial or venous, active or passive, inflammatory or atonic, functional or hypostatic; or if associated with different parts, as cerebral, spinal, pulmonary, renal, hepatic, etc. Arterial or active hyperaemia is caused by the increased flow of blood to a part; it may be inflammatory, when the blood is in excess for the purpose of eliminating irritating substances; or functional, when it is due to the normal action of some organ. Venous or passive hyperaemia is caused by delay in the return of the blood to the heart; it may be atonic, when it is due to the enfeebled or

obstructed state of the circulatory system; or hypostatic, when it is due to the action of gravitation. The last two states are necessarily often associated.

Active hyperaemia may be caused by nervous disturbance due to emotion, as in blushing; by increased functional activity; or by local external stimulation, as the application of heat, poultices, etc. The symptoms are redness in the adjacent parts and a throbbing which eventually becomes painful. If long continued, a possible effect is hypertrophy of the tissues affected, owing to the excess of nourishment; while a sudden hyperaemia may result in the rupture of blood-vessels and the exudation of blood into the neighbouring parts.

Passive hyperaemia may be caused by loss of power in the heart due to old age, debility, or valvular disease. It may also be induced by the action of cold which constricts the veins and capillaries without affecting the deeper lying arteries; or by applying a ligature or tight bandage to a limb or other part. The most dangerous conditions are occasioned by embolism, or the blocking of a blood-vessel by a fragment of tissue carried along with the blood-stream; or thrombosis, which is the sudden clotting of the blood at some point in the course of a vessel. The surface symptoms of passive hyperaemia include a deepening of the colour to purple. The possible effects are exudation of blood into adjacent parts or necrosis of tissues owing to failure of the nutritive functions of the blood.

C. of the lung is a stage of heart disease and of pneumonia, and may occur by reason of the settlement of venous blood in the base of the lung when the heart is enfeebled by old age or the exhausting effects of fevers, etc., resulting in hypostatic pneumonia. C. of the kidney is active when there is irritation from drugs such as cantharides, or from microbic poisons; it is passive in heart and lung disease or when the *vena cava* is obstructed by tumours. C. of the liver and digestive tract is a normal condition during the process of digestion. It may become excessive through the use of rich or stimulating food. C. at the rectum may lead to the formation of haemorrhoids or piles. C. of the brain is often due to embolism or thrombosis, in which case it is known as apoplexy and is characterised by varying degrees of loss of consciousness and paralysis according to the site of the vessels involved. C. is sometimes induced for remedial purposes, as in the application of poultices, hot air, etc. See BIER'S CONGESTION TREATMENT.

Congleton, municipal bor. of Cheshire, England, on the R. Dane, 8 m. SW. of Macclesfield. Its prin. manufs. are textiles and machine tools. Moreton Old Hall lies $4\frac{1}{2}$ m. SW. of C.; it is a property of the National Trust. Dating from between 1559 and 1589, it is generally considered to be one of the most perfect specimens of the black and white architectural style in England. Pop. 15,500.

Conglomerates (from Lat. *conglomerare*

to form into a ball) is the geological name for consolidated gravels or bouldery deposits, many of which were formed as beach deposits. C. consist of rounded pebbles, which owe their smooth surfaces to attrition during transport in the water, set in a matrix of finer material. In some beach deposits the boulders and pebbles make practically the whole of the rock and the interstitial material is reduced to the spaces between the tightly packed pebbles. In other C. the pebbles are scattered through a rock composed for the most part of finer grained material; the term 'boulder bed' can be used for

the C. mouth, which was believed to be the outlet of the Niger R., but the expedition ended fatally. Later 2 expeditions under Cameron and Grady went to the assistance of Livingstone, who d. at Lake Bangweulu. Cameron's expedition led politically to the opening-up of the country under the auspices of King Leopold, and in 1877 Stanley made his famous voyage down the C. from the Luapula to the sea. The actual source of the riv. is still disputed. Geographically the Lubudi, which flows into the Lualaba above Bukama, is the headstream of the C., as from there to the mouth of the C.



E.N.A.

THE HEADWATERS OF THE RIVER CONGO

rocks with a few boulders very much larger than the particles making up the bulk of the rock. The pebbles in a conglomerate are usually of hard and resistant rock such as quartzite, chert, flint, sandstone, gneiss, or granite. C. may be formed also under continental conditions, by streams, as scree or talus cones, or as conglomerates on the margins of inland plains. In some continental C. the pebbles are less well rounded than in marine C. The form of the conglomerate bed may indicate the way in which it originated, as may the nature of the adjoining rocks.

Congo, second riv. of the continent of Africa in point of drainage area (1,425,000 sq. m.), and also in point of length (about 3000 m.) whilst in volume of water it is surpassed only by the Amazon and the Mekong. The mouth of the C. was first discovered in 1482 by Diogo Cão, the Portuguese explorer, who estab. a settlement. Nearly 400 years later a Brit. expedition under Capt. Tuckey surveyed

the riv. valley shows normal development. But if the source of the C. is to be found in the headstream of its furthest trib., the C. may be said to rise in a high table-land between Lakes Tanganyika and Nyasa at an altitude of 5000 ft. Its 2 headstreams, the Chozi and Chambezi, after their union, enter Lake Bangweulu, and on their exit at the S. corner are known as the Luapula, which soon hurls itself over the Mumbatuta Falls. With a breadth varying from 300 to 1150 yds., the Luapula passes through Lake Mweru (2800 ft. high), and in its journey across the Mitumba Mts falls some 1000 ft. Soon afterwards the main riv. is joined by the Lualaba and Lubudi, together with 2 other streams from the W. Up to the Stanley Falls, 2 rapids only—those at Nyangwe and Ukassa—make the C. unnavigable. Stretching now often over a m. from bank to bank, it receives from the E. the Lukuga, which drains Lake Tanganyika, and further N. the Lira and

Urindi, coming from the forest tracts. The Middle C., which enters the alluvial plain of W. equatorial Africa at an elevation of 1300 ft., runs mainly in a westerly direction till it turns sharply southward near Bangala. Of the S. tribs. the Lomami, which pursues a course mostly parallel to the Upper C., is the chief, whilst the Lulonga joins the main stream many m. to the W. Other affluents on this side are the Ruki and the streams of the great Kasai system, including the Lukeni, Sankuru, Lulua, Djima, and Kwango. Joining the Middle C. on the right or N. bank are the great Aruwimi and Ituri, which rise near Lake Albert and water the equatorial forests, the Rubi, and the Ubangi or Welle, which is far the largest trib. on this side. Below the Ubangi is the Sanga, which flows into the C. with a southerly direction. There are many lacustrine expansions along the Middle C., the last being that of Stanley Pool, which is 1000 ft. above sea level. This part of the riv. is navigable for some 1020 m. Above Man-yauga, on the Lower C., there are about 20 rapids in a course of 90 m. From this place to Isangila, a distance of 70 m., the riv. is navigable, whilst below 10 more falls intervene. During this part of its course the C. drops 850 ft. in 146 m. Round the non-navigable sections of the riv. railways have been constructed to carry freight, etc. From Matadi to the Atlantic, which the great riv. finally reaches with a S.-westerly course, the distance is c. 90 m., and may be covered by ocean vessels. The C. alone of African riva. can boast of a true estuary, the bottom being a great canyon extending 100 m. out to sea and obtaining in some places a depth of 4000 ft. below the normal sea level. At its mouth the C. is 6 m. wide. See T. A. Barnes, *The Wonderland of the Eastern Congo*, 1922.

Congo, Belgian, formerly **Congo Free State** and now a colony of Belgium. Its coast-line is only 25 m., but its whole area is some 925,780 sq. m. The B. C. is bounded on the N. by Fr. Equatorial Africa, on the NE. by the Sudan, on the E. by Uganda and Tanganyika., on the SE. by N. Rhodesia, on the SW. by Angola, and on the W. by the Atlantic. The central zone of the colony is a great table-land with an average altitude of 3000 ft. above sea level. It is a well-watered country, covered with wooded savannahs and forests which grow in the riv. valleys, especially towards the E. and NE. of the state. The forest region, stretching from Lake Albert to the mouth of the Aruwimi, known variously as the Great Congo, the Stanley (from its discoverer), and the Pygmy (from the small people inhabiting it) Forest, covers an area of 25,000 sq. m. Insect and animal life of brilliant colour and every variety of form flourish. The long mt. chain, known as the Mitumba Mts., which has peaks varying in height from 5000 to 10,000 ft., runs from the SE. boundary in a N.-easterly direction to Lake Tanganyika, and then northward past Lake Kivu to Lake Albert. The Bambara Hills, to

the W. of Tanganyika, are an offshoot of this range. The W. slopes descend gently to the C. basin, but the E. face is often very abrupt. The Crystalline Mts. follow the coast-line. N. of Lake Kivu, the W. shores of which are in the colony, are sev. volcanoes which belong geographically to the Nile basin. The C. It., dealt with in another article, is the most important physical feature of the state, as it is also largely responsible for its commercial development. Rubber is obtained from the lianas of the forest. Giant baobabs grow on the savannahs, and in the forests many timber trees, such as teak, ebony, mahogany, besides bamboo palms and resin-yielding trees, and great euphorbias and orchillas are plentiful. There are abundant plantain and banana trees, and in some parts cotton and coffee plants are indigenous. Crocodiles and hippopotami are found in great numbers in the riv., whilst red buffaloes and antelopes wander in the open country, and in the forests a great variety of wild animals abounds, including the chimpanzee and other monkeys, the lion, elephant, jackal, leopard, etc. Storks, parrots, and ibises are quite common, and terns, hawks, and herons are found by the banks of the C. Ants, mosquitoes, spiders, etc., exist everywhere, whilst dragonflies and butterflies are noted for their gorgeous colourings.

● The great humidity of the climate, combined with the heat, discourages European settlements, although in 1955 there were 89,311 whites, including 69,813 Belgians; 2002 British; 4503 Portuguese; 258 S. Africans; and 1955 French. Situated in the zone of the equator, the ann. variation of temp. is slight. The coldest month is July, the hottest Feb., the average ann. temp. being 90° F. In the W. of the colony rain falls regularly between Oct. and May, the rest of the year being the dry season. It will therefore be seen that along the lower reaches of the C. the period of heavy rains coincides with that of the greatest heat, so that it is not surprising that fevers are much more prevalent here than in the central plateaux, where, moreover, the precipitation is dispersed fairly evenly over the whole year. The rainfall varies, rising sometimes to 38 in.

(Communications. There were (1953) 74,000 m. of roads (20,000 m. first class); and 3100 m. of railway line stretched from Matadi, the most important port on the lower Congo, to Dolo on the Stanley Pool. There is also a line from Stanley Falls to the Nile and from Stanley Falls to Nyanagwe on Lake Tanganyika. The R. Congo (q.v.) is navigable from its mouth to Matadi (c. 90 m.) by ocean going vessels. The next 250 m. as far as Stanley Pool (Leopoldville) is impeded by rapids. After the Pool, for 1000 m., as far as Stanley Falls, the riv. is again navigable. Together with the many and great tributaries, 6300 m. of waterways are open to shipping. Air mail services are well developed locally, and there are frequent services to Europe, to the Federation of Rhodesia, and to S. Africa. Wireless

stations are estab. at 150 points. Agriculture is still very undeveloped. There are, however, cocoa, coffee, rice, rubber, and tobacco plantations, and maize, manioc, and sugar-cane are also grown. Cotton is being increasingly cultivated and exported. Oil palms are abundant and supply an ever-increasing trade in palm oil and palm kernels. Rich deposits of uranium, radium, zinc, iron, cobalt, copper, and copper ore are found in Katanga, especially the S. dists. Diamonds are found in the Kasai dist. and include both gem and industrial varieties. Gold mines are worked at Kilo and the Mboga dist., Lake Albert (30 m. E. of Kilo), and also at Ruwe in Katanga. Other minerals worked include manganese, zinc concentrates, and tin. Large radium deposits occur in the Elisabethville Prov., where the large copper deposits are found. Bakuma is the centre of a rich tin region. Diamond-bearing gravels are exploited in the S. The gathering of the caoutchouc from rubber vines is the staple industry. Other exports, 75 per cent of which are sent to Belgium, are ivory, palm oil, coffee, rice, cocoa, timber, and white copal. Food, machinery, clothing, and arms are the chief imports.

The inhab. of the colony belong to the Bantu-Negro stock, but the small Pygmy bands, distributed in the great forests, probably are the survivors of the aboriginals of Central Africa. In the E. there are a number of tribes of Hamitic stock. They all speak different dialects of Bantu, but most of them understand Swahili. Elaborate funeral rites and the propitiation of countless malignant spirits are the chief articles of religion. The Bantu pop. is given at 12,026,159. Chief tns are the cap., Leopoldville, pop. 110,000 (16,564 whites); Matadi (400 whites); Elisabethville (11,008 whites).

Cameron's expedition in 1875 led to the formation of the Association Internationale Africaine under the auspices of Leopold II, king of the Belgians. The association was to suppress slavery and to civilise Africa, and a great impetus was given to the movement by the discoveries of H. M. Stanley (q.v.) in 1877. In 1885 the C. Free State was given international status by the treaty of Berlin. Before slavery could be suppressed, war took place between the Belgians and the Arab traders under Tippoo Tib. To aid the state to recover financially from the effects of the war Leopold adopted the concession system for exploiting the natural resources of the country. The system led to many abuses and the C. Free State was formally annexed by Belgium in 1908. The state became an absolute monarchy. A governor-general, with civil and military powers, represents the king in Africa. At home a colonial minister, advised by a colonial council, now supervises the government of the state, which for administrative purposes is divided into 6 provs.; the provs. are divided into 18 dists., the dists. into 123 tns. A univ. centre has been estab. at Kisantu, and technical and agric. colleges have been estab., chiefly to educate

recruits for the armed force of the state. European children (14,036) are educ. at 67 schools, and native children (1,053,119) at 24,577 schools (1953). A univ. was estab. at Lavanium, near Leopoldville, in 1954, and another (a state univ.) at Elisabethville in 1956. In 1927 some ter. in SW. B. C., area 3500 sq. km., was ceded to Portugal in exchange for an area of 3 sq. km. in the C. estuary. The cattle country of Ruanda-Urundi, formerly in Ger. E. Africa, is included in the Belgian administration of the C. under mandate from the League of Nations. See also CONGO. There is a dearth of books in English on the Belgian Congo, but the Board of Trade and Foreign Office publications contain up-to-date statistics. Sev. travel books of doubtful value to the student have been pub.

Congo, French, see FRENCH EQUATORIAL AFRICA.

Congo Red, see DYE.

Congregation (Lat. *cum*, with, *gregare*, to gather into a flock), collection of people, the term usually being applied to those gathered together for public worship. In the Rom. Catholic Church it denotes certain bodies of men—such as cardinals—who meet together with a special object connected with the affairs of that Church. Thus there is the C. of the Council, which enunciates the formal interpretation of the Council of Trent; the C. of the Propaganda, which looks after missionary affairs; that of the Holy Office of the Inquisition, which judges matters of faith; the C. of the Index, forbidding the reading of certain books; and sev. others. The term is sometimes applied to a body of men who undertake to observe certain rules, but are under vows less strict than those of the monks, as the Passionists and others. It also signifies a certain number of monasteries which band together in an autonomous federation: thus in the Benedictine order there were the C.s of Bursfeld and St Maur. The univs. are governed by bodies known as C.s, composed of all resident Masters and Doctors. The Congregationalists obtained their name from the fact that they believe in the basis of government being laid down by each C. for itself.

Congregation of the Holy Office of the Inquisition, see OFFICE, HOLY.

Congregationalism, name given to that part of the Protestant Church which, in organisation, is based on independency, in the sense that each body of worshippers or congregation is locally governed and answerable only to itself. It is one of the most important of the Free Churches in the United Kingdom, and occupies an equally important position among the Protestant non-episcopal churches of the U.S.A. Regarded generally, it is one of the three great systems of eccles. gov. and organisation as contrasted with Episcopacy on the one hand and Presbyterianism on the other. In England, the original home of the principles of C., its rise and development were very gradual, and began in a separatist movement from the Church as under the supreme headship of the Crown. In Mary's reign small

secret congregations met under Protestant clergy, and without them if such were not obtainable; in Elizabeth's reign these meetings increased and, realising that no real chance of reformation was coming, began definitely to arrange themselves in local bodies and conform only to what they held to be the real teaching of the N.T. Robert Browne (1550-1633) stands out as the most important figure and leader of the separatist Puritans; after great persecution he and as many of his congregation as were able emigrated to Zeeland in Holland. Here they were tolerated, but owing to differences among themselves this community broke up. Persecution in England gave them extra strength, but again differences arose; Smyth, one of the Zeeland community, became a Baptist, and a Baptist community settled in England; John Robinson, whose views were identical in the main with those of modern C., differed from Robert Browne, and started large and for a time flourishing communities. During the Civil war the Independents, as they now began to be called, grew and estab. themselves widely and firmly, and had a great influence in resisting the estab. of Presbyterianism. The real hist. of religious liberty may be regarded as beginning at that time and through them. Cromwell was a follower and supporter of them, especially in their political views, and the Protectorate saw them firmly settled. The Restoration forced them, with the Baptists and Eng. Presbyterians, into Nonconformity. The hist. of early C. is closely connected with the Puritan migration to America (see below). The Toleration Act, 1689, gave freedom of religious thought to all parties, and this was followed by a period of stagnation or apathy, not only confined to them, to be stirred to a greater spiritual enthusiasm under the inspiration of the Methodist movement of the 18th cent., when the numbers of Congregational bodies increased enormously. The 19th cent. was marked by a tendency to combination. In 1811 the Congregation Union of Scotland was formed, and in 1831 the Congregational Union of England and Wales. In 1896 the Congregationalists and the Evangelical Union combined in Scotland. The Congregational Union is one of the prin. members of the Free Church Council, founded in 1893. It supports home and foreign missions, the London Missionary Society especially owing much to it. All social reform movements are supported by it. The Memorial Hall in Farringdon Street, London, is the official centre. There are about 4200 churches and mission stations in Great Britain, with over 1000 churches in Brit. dominions; there are also churches in many parts of the European continent. The most recent (1956) statistics give 220,000 members in England, 121,000 in Wales, and 35,500 in Scotland. The International Congregational Council first met in London in 1891 and was fully organised, 1949, with headquarters at the Memorial Hall, London.

The hist. of Amer. C. begins with the

arrival in 1620 of Wm Brewster, elder of the refugee Church in Leyden, whose small band founded Plymouth in the modern Massachusetts, though strictly this group were Separatists. The enthusiasm that marked the early years of Amer. C. waned and it was not until 1734 that the 'revivalist' work of Jonathan Edwards (followed by that of Whitefield in 1740) roused fresh zeal. But the Edwardian standpoint was followed by nearly fifty years of apathy, during which interest centred mainly on doctrinal controversy. The 'New England Theology' of Edwards, Bellamy, and Timothy Dwight soon became predominant, and was generally in vogue at the beginning of the 19th cent. The 'Literal' school of Chauncy and Mayhew, however, rapidly grew in importance, and as early as 1805 was recognised in Harvard College as predominant. C. has never, however, made much headway in the S. states, the influence of the above theological schools, which emerged out of the old Calvinistic theology of the early New England settlers, being more or less confined to New England states. But it has spread to the W., although it was not until about 1850 that Amer. Congregationalists began to unite and to spread their distinctive policy in the W. states and ters. There has, in the last few decades, been a spread in the community of innovations in doctrinal opinions, and a wider diversity of belief, with the result that 'Evangelical' (popular sense) rather than 'Calvinistic' is the more appropriate definition of Amer. Congregational preachers and churches. Besides some 500 foreign mission churches, there are at the present date about 5500 Congregational churches in the U.S.A. More than 600 of them are in the state of Massachusetts, which is the stronghold of C., no other state reaching the 400 mark. The members of the body number 1,350,000. In 1931 the Congregational Churches united with the Amer. Christian Church. In 1956 a merger was agreed with the Evangelical and Reformed Church. See R. W. Dale, *History of English Congregationalism*, 1907; A. Peel, *A Brief History of English Congregationalism*, 1931; and G. G. Atkins and F. L. Fagley, *History of American Congregationalism*, 1942.

Congress (Lat. *congressus*, an assembly; from *cum*, together, and *gradus*, a step). In its diplomatic sense a C. means a gathering together of sovereigns or their representatives to discuss questions of international interest. Famous C.s of the past were those of Munster and Osnabrück, which resulted in the treaty of Westphalia, 1648, and at the end of the Thirty Years War; of Radstadt, at the end of the Sp. Succession war, in 1713; of Vienna, at the end of the Napoleonic wars in 1815; of Paris, in 1856, at the end of the Russian war; and of Berlin, in 1878, at the close of the Russo-Turkish war. But the name C. has come to be applied in Federal states to the legislative assembly which directs national or federal as contradistinguished from state or prov. concerns (see article below). Still

more recently the name has become associated with the Indian Nationalist or Home Rule movement (see INDIAN NATIONAL CONGRESS) and the Trades Union C., to which body are affiliated most of the British trade unions (see TRADES UNION CONGRESS).

Congress, Library of, see LIBRARY OF CONGRESS.

Congress of the United States, the National Legislature, consisting of the Senate and the House of Representatives. The Senate numbers 96 members, each state electing 2 members for a period of six years, one-third retiring every two years. The House of Representatives consists of 435 members from the states, elected on a basis of pop., including a delegate from Alaska, a delegate from Hawaii, and one resident commissioner from Puerto Rico. The C. is subject to the constitution, which it may not amend save by a two-thirds majority in each House, followed by approval by three-fourths of the states in the Union; and it is not concerned with the executive power, which is decided by popular election. Its legislative power is limited by the existence of the govts. of the individual states, which it may not overrule. The Supreme Court of the U.S.A. has the right to nullify any Act of C. which is judged unconstitutional. Within the constitution the powers of C. are: (1) to levy taxes, duties, imports, and excises; (2) to borrow money on the credit of the U.S.A.; (3) to regulate commerce, foreign and interstate; (4) to establish a uniform rule of nationalisation and uniform laws on bankruptcy; (5) to coin money and to fix the standard of weights and measures; (6) to provide for the punishment of counterfeiting the securities and current coin of the U.S.A. (a resulting power of C. includes the whole of the Criminal Code); (7) to establish post offices and post roads; (8) to promote the progress of science and the useful arts; (9) to constitute tribunals inferior to the Supreme Court; (10) to punish piracies and felonies on the high seas and offences against the law of nations; (11) to declare war; (12) to raise armies; (13) to maintain a navy; (14) to call forth the militia to execute the laws of the Union, suppress insurrections, and repel invasions; (15) to provide for organising, arming, and disciplining the militia; (16) to exercise exclusive legislation over the national capital; and (17) to make all laws which shall be necessary and proper for carrying into execution the foregoing powers. Within these terms C. has to deal with a vast amount of legislation. Bills are proposed by private members, and the committee system has been introduced for reporting on and sorting out those which merit immediate consideration. The President has the power of veto (see ACT). C. meets once a year, but the President may convene one or both of the Houses in special session. The first session lasts from Dec. of the odd-numbered years until the summer; the second session lasts from Dec. of the even-numbered years until 4 Mar. C. came into being after the adoption of the

Federal constitution, and arose out of the old continental C. held since 1789.

Congreve, William (1670-1729), dramatist, b. Bardsey, Yorks. He was educd. at Kilkenny school, where he was a contemporary of Swift, and at Trinity College, Dublin. His father was a lieutenant in the Irish Army and his father's home was Lismore Castle. C. himself was b. on the estate of his great-uncle on his mother's side, Sir John Lewis. Intending to go to the Bar, he left Ireland and came to London, where he entered himself as a student of the Middle Temple; but he soon abandoned law for literature. He made his debut as a man of letters with a novel, *Incognita or Love and Duty*



WILLIAM CONGREVE

Reconciled, 1692, pub. under a pseudonym. He next turned his attention to the stage, and his first comedy, *The Old Bachelor*, was produced, 4 years after it was written, at Dury Lane in Jan. 1693. This was sufficiently successful to justify the management in putting up, in Nov. of the same year, his second play, *The Double Dealer*, which proved very popular. Some time after, Betterton and others of the Drury Lane company seceded, and opened a new theatre in Lincoln's Inn Fields on 30 April 1695, with C.'s *Love for Love*. This proved so much to the liking of the public, and consequently so profitable to the managers, that C. was given a share in the theatre, he, for his part, undertaking to produce a play every year. With this condition, however, he did not comply. Indeed, he wrote only 2 more pieces, a tragedy, *The Mourning Bride*, played at the Lincoln's Inn Theatre in 1697, and a comedy, *The Way of the World* in 1700. *The Way of the World* was received coldly, but the author assured his sympathisers that he was indifferent. His other literary work was the composition of poems not of serious importance.

He rendered some service to letters by assisting Dryden in his trans. of Juvenal, 1692, and Virgil, 1697, of which assistance Dryden made due acknowledgment. C., in company with Wycherley, Vanbrugh, and Dryden, was severely mauled in Jeremy Collier's *Short View of the Immorality of the English Stage*, 1698. The other writers kept silent—Dryden afterwards admitted the justice of the reproof—but C. replied in the same year in a pamphlet *Amendments of Mr Collier's False and Imperfect Citations* (from C.'s plays), which Collier answered vigorously and effectively.

C. had ample means, derived from sinecures, for from 1695 to 1707 he was commissioner for licensing hackney-coaches, an office which 10 years later he exchanged for the more lucrative commissionership of wine licences. In 1714 he exchanged this position for that of secretary for Jamaica, worth about £700 a year, which he held conjointly with a place in the pipe-office, that brought him in nearly as much. He had lived with Mrs. Bracegirdle—there were rumours that he married her—but on his death he left her a legacy of only £200, and left the duchess of Marlborough, who did not want money, the bulk of his estate, worth about £10,000. The duchess spent £7000 of the money on a diamond necklace. All this has prejudiced C.'s reputation as a man; but his legacy to the wealthy duchess is accounted for by the fact that the money was destined for her daughter who was his child. For how otherwise could he, without scandal, have transmitted it? The duchess bequeathed the legacy to the daughter, Mary. Mrs. Bracegirdle, to whom C. was faithful for 10 years, and who left him for the wealthy Lord Scarsdale, had retired in easy circumstances 20 years before C. d. After 1710 C. was afflicted with bad sight and bad health. He met his death as the result of injuries received in a carriage accident, and was buried in Westminster Abbey.

C.'s plays are chiefly remarkable for polished dialogue coupled with a cynical heartlessness and a fashionable licentiousness. *The Way of the World*, his masterpiece, scintillates with an arctic brilliance. In few plays is the art more adroit, the wit more polished; yet in few is there less of real human interest. It was the fault of C.'s age, perhaps, that he could not deviate from the restrictions of artificial comedy into those broader scenes of life and that wider outlook which lift Vanbrugh, despite his inferior technique, almost to the level of C. C. has not the robustness nor audacity of Wycherley, but in his own mode and sphere he is unsurpassed. *The Way of the World* ran for over 100 nights at the Lyric, Hammersmith, in 1923, and has been put on more than once in recent years. The long run of *Love for Love*, revived during the Second World War, showed that C.'s popularity as a dramatist had actually, in 1944, reached again the pitch it once attained in his lifetime. J. C. Hodges's *William Congreve: the Man*, 1944, helps towards a better understanding of C.'s early success as a playwright

and of his subsequent motives and character, besides confirming various facts concerning his birth and youth. Hitherto, C.'s reputation as a man has suffered from Voltaire's statement that C. referred to his own works as 'trifles,' and told Voltaire that he would rather be considered 'a gentleman who led a life of plainness and simplicity' than a dramatist. But C.'s estimate of his own work, which disgusted Voltaire, was not due to false modesty or to snobbishness. 'Being a thorough artist and also a detached unambitious man, he considered the comedies which had made his reputation "trifles"; even *Love for Love* he thought "homely fare," though for *The Way to the World* he made no such apology.' There are eds. of C.'s plays by A. C. Ewald (1887), W. Archer (1912), and J. W. Crutch (1927). C.'s *Complete Works*, including the adaptation of Molière's *Monsieur de Pourceaugnac*, *Squire Trelooby*, written in collaboration with Vanbrugh and Walsh (1704), ed. by Dr. Montague Summers, was pub. in 4 vols. in 1923. See Sir E. Gosse, *Life of William Congreve*, 1888, 1924; D. C. Taylor, *William Congreve*, 1931.

Congreve, Sir William (1772–1828), inventor of the C. rocket which was successfully employed at the siege of Copenhagen, Lord Gambier's engagement in the Basque Roads (1809), and at Leipzig (1813), where the Rocket Troop of the Royal Artillery did yeoman service. Besides publishing three treatises on his rocket, which was later superseded by Hale's, C. patented many other inventions, including a process of colour printing, pyrotechnic improvements, a smoke-consuming device, and a gun-recoil mounting.

Coni, see CUNEO.

Conia, Conine, or Conline (C,H,N), alkaloid contained in the seeds of the spotted hemlock (*Conium maculatum*). It is a colourless, oily liquid with a penetrating smell, boils at 167°C., turns brown on exposure to the air, and is soluble in alcohol. It is strongly basic; the prin. salts are conine hydrochloride and conine hydrobromate. The alkaloid and its salts are strongly poisonous; moderate doses produce motor paralysis without loss of consciousness, and larger doses cause death by paralysis of the organs of respiration. Small doses are valuable in acute mania, delirium tremens, and tetanus.

Conic Sections, curves which are formed by the intersection of a cone by planes in different directions. See GEOMETRY, *Higher Pure G.*

Conical Projection, system by which points, lines, and areas on the surface of a sphere or other solid are represented by corresponding markings on the surface of an enveloping cone. As the earth is a spheroid, it is impossible to represent accurately on a plane map the relative distances of points on the earth's surface. A cone, however, is a surface which can be unrolled, or spread out on a plane, to form a sector of a circle. If, therefore, the earth is imagined to be enveloped by a cone touching a certain parallel of

lat., the distances on that parallel are accurately rendered on the map when spread out, while the inaccuracy increases as the regions on the earth's surface become more remote from that parallel. In such a map the meridians are represented by straight lines converging to the pole, and the parallels by circles having the vertex of the cone as centre. The method is particularly applicable to maps of the polar regions.

Coniferae, most important class of Gymnosperms, consisting of about 400 species of resinous trees and shrubs, now grouped under the families Pinaceae, Cupressaceae, and Taxaceae. They are mostly erect evergreens, except larch (*Larix*), and usually grow in dense forests in temperate and sub-tropical parts and mts of the world. Stems are usually freely branched, leaves simple and usually small, flowers always unisexual, the male in cones or catkins on the main axis, the female in cones with naked ovules on the surfaces of the scales; fertilisation is by means of a pollen tube. The class furnishes softwood timber, resin, turpentine, tars, etc., and a few species produce edible seeds. See W. Dallimore and A. B. Jackson, *A Handbook of Coniferae, including Ginkgoaceae*, 1923.

Conil, Sp. vii. in the prov. of Cádiz, on the Atlantic, at the mouth of the Salado. It has sardine and tunny fisheries. Pop. 5500.

Conine, or **Conifine**, see **CONIA**.

Coningham, Sir Arthur (1895-1948), air marshal, b. Brisbane, Australia, and educ. at Wellington College, New Zealand, and at New Zealand Univ. Enlisted in Canterbury (New Zealand) Mounted Rifles, 1914, but after service in the Middle E. was invalided out of the army, 1916. Later he joined the Royal Flying Corps, serving with great distinction in France as a fighter pilot. Commanded a flight of aircraft in 1925 on the first flight from Cairo to Kano (Nigeria), thus opening the way to an air route across Africa. Awarded A.F.O., 1926. Held sev. important posts before his transfer in 1941 to the Middle E., where he was put in command of the air forces in Libya, later known as the desert air force. He and Sir A. Tedder (q.v.) were the primary designers of the air side of the plan by which the action of all three services was integrated; for though such a system had long existed in theory, it was first applied in Libya. In Feb. 1943 C. was assigned the work of concerting the air operations in support of the Brit. First and Eighth Armies in Tunisia. With the acting rank of air marshal C. was then put in command of the NW. African tactical air force and continued to command the tactical air forces in the field in Sicily and Italy. In 1944 he was appointed air officer commanding the R.A.F. second tactical air force, which operated with the Brit. and Canadian Armies on the W. front. After the war he became air officer commanding in chief, Flying Training Command. Killed when travelling as a civilian passenger in an aircraft, which was lost on a flight from the Azores to Bermuda.

Conisbrough, tn in Yorkshire, England, 5 m. from Doncaster, celebrated for its ruined Norman castle. Rhinoceros bones have been found here. Pop. 16,500.

Coniston, vill. on the shores of C. lake in the N. Lonsdale div. of Lancashire, England. There are slate quarries in the vicinity. John Ruskin resided at Brantwood, his property in the par., and is buried in the churchyard. Pop. 1100.

Coniston Grits and Flags belong to the Ludlow group, which is the geological name of one of the upper sub-divs. of the Silurian rocks in Great Britain. They occur in the Silurian area of the Lake Dist., Cumberland, being named after Lake C.

Coniston Lake, one of the smaller lakes in the Eng. Lake Dist., much visited on account of its natural beauty and associations by tourists from Grasmere and Ambleside. It is situated in N. Lancashire, 14 m. W. by N. of Kendal, with which it is connected by the railway, and 9 m. W. of Bowness on Lake Windermere. The breadth is only $\frac{1}{2}$ m. compared with a length of 5 m., the NW. extremity being overlooked by the round-backed landmark known as C. Old Man (2633 ft). Perch and trout are fished from its waters. Brantwood, once the home of Ruskin, stands some way above its E. shore. The most picturesque view of the lake may be obtained from the rising known as Tarn Hawes.

Conium, see **HEMLOCK**.

Conjeeveram, see **KANCHIPURAM**.

Conjugal Rights, see **MARRIAGE**.

Conjugation: 1. Term in grammar applied to a verb to denote its different forms. These forms may be obtained by inflection or by the use of particles and other words, the latter giving the periphrastic form of the verb. Verbs are conjugated to express differences of voice, mood, or tense.

2. Term used in biology for a process which leads to the rejuvenescence of cells or to the reproduction of their kind, and is common only to the lowest forms of animals and to plant life. Among the animals to which this method of reproduction is common may be mentioned the *Amoeba*, *Paramecium*, and *Vorticella*; among the plants, the *Spirogyra*.

Conjunctions, in grammar, are words used as connectives between one word and another, or one sentence and another.

Conjunctiva and Conjunctivitis. The C. is a mucous membrane lining the inner surface of the eyelids, and covering the anterior surface of the eyeball, except the cornea (see *under* **EYE**). The former is called the palpebral, and the latter the ocular, part. The C. is very subject to inflammation of varying degrees of severity. The cause of this may be irritation from any cause such as smoky atmosphere or exposure to dust or too bright light. C. is often associated with the infectious diseases, particularly measles. A highly infectious form of C. is prevalent in schoolchildren and is caused by the kochs-weeks bacillus. The eye becomes bloodshot and there is a watery discharge which later becomes purulent.

This form of C. has long been known as 'pink eye.' It yields to treatment with penicillin drops and penicillin eyecointment. See also TRACHOMA.

Conjuring, art of producing apparently miraculous effects by tricks or illusions, so as to deceive the audience. They may be done by sleight of hand and dexterity, combined with a momentary diversion of the attention of the spectators induced by the performer. Large numbers of tricks with cards, coins, etc. are performed solely by sleight of hand; the prin. basis of these is the concealment or rapid passing of a card, coin, or small object in or to the palm of the hand; these tricks are elaborated by means of mechanical contrivances, objects concealed in the sleeves, etc., and with specially made or marked packs, etc. They are styled tricks of legerdemain or prestidigitation. Another class are those based on natural phenomena unappreciated by the audience, such as the effect of combining chemical substances, etc. Further, many wonderful feats, especially of E. jugglers and conjurers, are attributed to hypnotism and the undoubted power of thought transference and suggestion. Elaborate code signals explain many other tricks. Further we get the illusions proper, the vanishing figures, automatic figures, speaking heads, and all the devices of the modern scientific conjurer and wonder-worker. C. is often styled white magic, to distinguish it from sorcery or black magic. C., or magic, is a very ancient art; the people of the E. delighted in and feared their magicians. The Syrians and Babylonians, and especially the ancient Egyptians, were exceedingly clever conjurers. The ancient Greeks and Romans also delighted both in C. and juggling, and from ages past till to-day the Hindus have been experts in the art. From China and Japan have come many elaborate and beautiful tricks with birds in cages, gold-fish, and the like. The mechanical figure has a long hist., and so has the production of spectral figures or phantasms, obtained by reflection on smoke or on mirrors. Considerable interest was aroused in recent times by the offer of J. N. Maskelyne of a large reward for an imitation of his famous box-trick; the result was a lengthy legal suit carried to the House of Lords. The successful imitator won his case, though his box was not the same as Maskelyne's.

The wonders of the medieval sorcerers were worked on many of the principles developed and improved to-day, when every branch of physical science, chemistry, optics, mechanics, and electricity is called to the aid of the conjurer or illusionist. J. E. Robert-Houdin (1805-71) was one of the most famous of modern conjurers. His Temple of Magic in Paris was the scene of many marvels, in which he used electromagnetism; though a German, Döbler, in 1842, was the first to use electricity in his trick of lighting 200 candles at once by the firing of a pistol. Houdin, it may be recalled, was sent to Algiers by the Fr. Gov. to prove that the

marabouts were not in league with heaven. The production of objects, of which the rabbit from the hat is the most familiar, has long been a favourite, and has had endless modifications and elaborations. In modern Egypt the street and bazaar conjurers abound. Many of their tricks are performed with mirrors, and in special cases hypnotism and thought-reading play a part. Disappearing figures appeared in England as early as Chaucer, and in the 16th cent. spectral illusions were exhibited in the Colosseum. In the 18th cent. a vanishing figure was produced with the aid of mirrors in France. The illusion of unsupported figures floating in the air was first produced by the Chinese. Roger Bacon was said to have a speaking head of brass, and throughout the Middle Ages we have allusions to man's feats of so-called magic and sorcery which are eclipsed by the white magicians of to-day. Few tricks have surpassed Maskelyne's 'Vanishing Lady,' or his automaton, Psycho, and other performing figures. See L. Hoffman, *Modern Magic*, 1877; E. H. Jones, *The Road to Endor*, 1920; H. Houdini, *Paper Magic*, 1922; W. Goldston, *Great Tricks Revealed*, 1935; J. Maskelyne and A. Groom, *The Book of Magic*, 1936; J. Maskelyne, *White Magic*, 1937; W. B. Gibson, *Professional Magic for Amateurs*, 1948.

Conkers may not be as old as horse-chestnuts or boys, but it is an ancient continuation of the two. Each player gathers a horse-chestnut, bores it through the centre, bakes it in the oven, and threads it on string knotted at one end. One player holds the conker hanging waist high while the other strikes with his own. Players strike alternately and the one whose conker shatters loses. A one-victory conker which beats a 'fiver' becomes a 'sixer' and so on.

Conkling, Roscoe (1829-88), Amer. politician and lawyer, b. Albany, New York. From 1859 to 1863, and again from 1865 to 1867, he sat in Congress as Republican representative. His final resignation was due to his election as U.S. senator, a position he occupied for fourteen years (1867-81). As regards the conduct of the Civil war and the treatment of the S. states he proved an energetic supporter of the policy of Lincoln and Grant, and consequently an opposer of Johnson's reconstruction policies. In 1880 his vigorous championship of Grant and his rivalry with Blaine (q.v.) led to a split in the Republican ranks. His resignation of his senatorship took place in the following year. He had a protracted dispute with Garfield on the question of the New York patronage.

Conn, Herbert William (1859-1917), Amer. biologist, b. Fitchburg, Massachusetts. From 1905 he was bacteriologist of the Connecticut State Board of Health and director of the state laboratory. He made a special study of the bacteriology of dairy products, publishing sev. works on that subject. Other works include *Evolution of To-day*, 1886; *The Study of Germ Life*, 1897; *The Study of Life's Mechanism*, 1899; *The Method of Evolution*, 1900;

Agricultural Bacteriology, 1901; *Social Heredity and Social Evolution—the Other Side of Eugenics*, 1921.

Conn, Lough, lake in the co. of Mayo, Rep. of Ireland. The R. Castlebar flows into L. C., which empties itself into the R. Moy.

Connaught, Prince Arthur (Arthur Frederick Patrick Albert) of (1883-1938), only son of Arthur, Duke of Connaught and Strathearn (q.v.); b. Windsor Castle; married, 1913, Princess Alexandra Victoria, Duchess of Fife, whose mother was the eldest daughter of Edward VII. He entered the army, serving in the Boer and First World Wars. He was Governor-General of the Union of S. Africa, 1920-4.



The Times

THE DUKE OF CONNAUGHT

Connaught and Strathearn, Arthur William Patrick Albert, Duke of (1850-1942), Brit. prince, seventh child and third son of Queen Victoria, attended the Royal Military Academy at Woolwich in 1866 and entered the Royal Engineers in 1868, being transferred to the Rifle Brigade the following year. He was made Duke of C. and S. in 1874. In 1879 he married Princess Louise Marguerite of Prussia (d. 14 Mar. 1917). Appointed major to the 7th Hussars in 1875, he became lieutenant-colonel of the Rifle Brigade in 1876. During the expedition to Egypt in 1882 he led the Guards Brigade at the battle of Tel-el-Kebir, earning a threefold mention in dispatches and receiving at the same time the order of C.B. In 1886 he received the Bombay command, being also, by virtue of his office, a member of the governor's executive council, and in 1890, on his return, was appointed to the command of the S. dist. as a lieutenant-general, and three years later he became general. In 1900, when Lord Roberts went to S. Africa, the duke took his place

as commander-in-chief of the army in Ireland, and in 1902 was promoted field marshal. From 1904 to 1907 he acted as inspector-general of the forces, and was commander-in-chief in the Mediterranean, 1907-9. In 1910 he represented the king on the occasion of the opening of the Union Parliament in S. Africa. In 1911 he became Governor-General of Canada, a post he held till 1916. In 1920 he went to India as the king's representative to inaugurate the new prov. legislative councils of Madras, Bengal, and Bombay. A study of his life, by Sir George Aston, was pub. 1929. He had three children: Princess Margaret (1882-1920), wife of the then crown prince of Sweden; Prince Arthur of Connaught (q.v.); and Victoria Patricia, b. 1886, who on her marriage to Capt. (later Adm.) the Hon. Alexander R. M. Ramsay in 1919 was authorised to renounce her title of princess.



THE ARMS OF CONNAUGHT

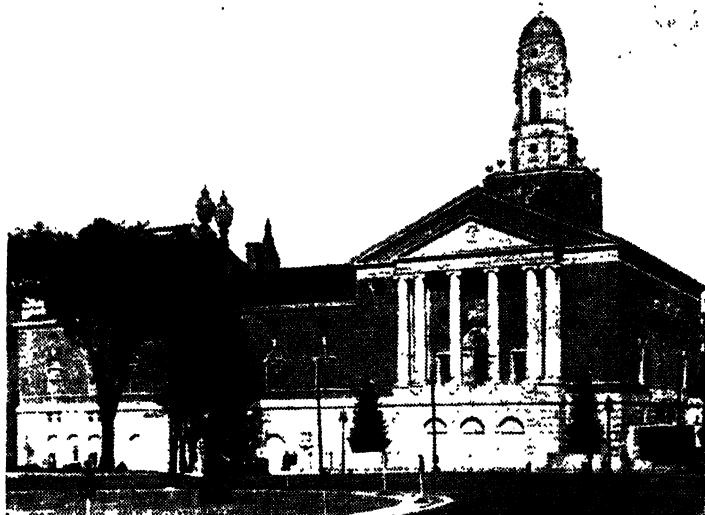
Connaught (Connacht), W. prov. of the Rep. of Ireland, comprising the cos. of Leitrim, Sligo, Mayo, Roscommon, and Galway. Area 6610 sq. m. See articles on individual cos. for pop. and topography.

Connaught Rangers. The old 88th Foot was raised in Connaught in 1793, to which circumstance it owed its title. In 1881 the old 94th Foot was linked to the 88th under the title of the C. R. In consequence of the inauguration of the Irish Free State some Irish regiments were disbanded in 1922, the C. R. being one. The regiment was with Abercrombie in the 1801 Egyptian campaign, and had 12 honours for the Peninsular war. It went through the Crimean campaign and helped to restore order in the Central Provs. during the Indian Mutiny. In 1877-9 it was fighting in S. Africa, and again 1899-1902. During the First World War it raised 6 battalions which fought in France, Flanders, Macedonia, Gallipoli, Palestine, and Mesopotamia. See H. F. N. Jourdain and E. Fraser, *The Connaught Rangers* (3 vols.), 1924-8.

Connecticut, one of the six of the New England states and of the original thirteen states of the U.S.A. It is bounded on the W. by New York, on the N. by Massachusetts, on the E. by Rhode Is., and on the S. by Long Is. Sound, the area, including land and inland waters, being 5009 sq. m.

The chief rvs. all flow in a southerly direction through gently undulating lands. The W. section rises to 2355 ft at Bear Mt and includes the Litchfield Hills. There are three riv. valleys of importance in the state—the Thames, Housatonic, and the Connecticut—each of the rvs. of which has numerous small tribs. C. was ravaged by disastrous floods in 1955, but is rapidly rebuilding affected tns and cities. The E. of C. consists mainly of hills with narrow and deep riv. valleys. In the N. the country is mountainous, but

carpets, hosiery, leather, boots and shoes; firearms, ammunition, cutlery, textiles, hardware, jewellery, chemicals, hats, boats, and wire products. C. ranks high in the matter of education. Yale Univ. has over 1000 teachers and 8000 students; the Wesleyan Univ. and the C. College for Women are other important colleges. C. is said to have been the first community in the world to form a written constitution by a social compact. This constitution was confirmed by Charles II in 1662. The General Assembly consists of the



Camera Press

THE HORACE BUSHNELL MEMORIAL HALL, HARTFORD, CONNECTICUT

the valley of the C. R. is broad and fertile, being mostly of Triassic formation, whereas the greater part of the rest of the state consists of rocks of granite and gneiss. Sandstone and feldspar are quarried at Portland. The climate of the state is subjected to extremes of heat and cold, while the soil in the N. part is fertile, and in the S. sandy. 1,900,000 ac. are classified as forest land. Agriculture is restricted to general farming and the growing of specialised crops. The best lands are in the C. lowlands, where shade-grown tobacco is extensively cultivated. Hay is one of the most important products, and dairy produce and fruit farms are also a source of wealth, and some cereals are grown. C. is a very important manufacturing state, and its position, together with the facilities afforded by its rvs., has largely contributed to this. Its manufs. are many and varied, the chief being brass, cotton, silk, and woollen goods;

Senate of 36 members and the House of Representatives of 279 elected for two years. The prin. cities are: Hartford, 177,390; New Haven, 164,443; Bridgeport, 158,700; Waterbury, 104,480; Stamford, 74,290; New Britain, 73,726; Norwalk, 49,600; and Meriden, 44,088. The pop. of C. is 2,007,280. See O. Shepard, *Connecticut, Past and Present*, 1939.

Connecticut River, largest riv. (345 m. long) in New England, U.S.A. Rising in the extreme N. of New Hampshire, it forms a boundary between that state and Vermont, crosses Massachusetts, and finally C., where it enters Long Is. Sound at Saybrook, 30 m. E. of New Haven. Its general course is always southerly. For ships of light draught it is navigable as far as Hartford (50 m. up). Extensive hydro-electric and flood-control projects include a new dam at Wilder, Vermont, and Fifteen Mile Falls Dam at Barnet,

Vermont. The lower valley is a rich agric. region; onions and shade-grown tobacco are produced in Massachusetts and C.

Connective Tissue, tissue of mesodermal origin present in every organ of the body and binding together and supporting the other elements of an organ. C. T. is composed mainly of inter-cellular substance with collagenous or white, elastic or yellow fibres, arranged in bundles or lattice-like patterns. Fatty tissue is also present in C. T. The density and strength of C. T. vary with the stresses and strains it has to bear in performing its function. See also **Tissue**.

Connellsville, city of Fayette co. in SW. Pennsylvania, U.S.A., situated on Youghiogheny R. and served by sev. railways. Here most of the coking coal for iron smelting in America is produced. There are many manufactories. Pop. 13,300.

Connemara (the Bays of the Ocean), known also as Ballynahinch, forms the westernmost div. of co. Galway, Rep. of I., and is itself subdivided into Joyce co. in the N., C. proper in the W., and Iar-Connaught in the S. In length it reaches for 30 m. whilst its breadth varies from 15 to 20 m. It is noted for its quarries of a green variety of marble. Kelp gathering and weaving are important local industries; tourists and artists are attracted by its wild scenery of bogs and mts, lakes and inlets, whilst anglers are certain of good sport.

Connorsville, city, cap. of Fayette co., Indiana, U.S.A., on Whitewater R., 20 m. SW. of Richmond. It is a railway centre with machine shops, and manufs. automobiles and parts, metal products, and kitchen equipment. Pop. 15,600.

Connétable de France, name used at different periods in Fr. hist. for different offices. Under the early kings it was applied to a dignitary at court, but in the reign of Philip II the commander-in-chief of the army was known as the C. Such was the C. until Richelieu removed him in 1627. But Napoleon revived the office in 1804, giving it to his brother Louis. It was finally done away with when the line of Bourbons was restored.

Connington, J. J., pseudonym of Alfred Walter Stewart (1880-1947), scientist and detective story writer, b. Glasgow, son of a prof. Educ. at Glasgow Univ. and Marburg, he became Prof. of Chemistry at Queen's Univ., Belfast. His *Recent Advances in Organic Chemistry*, 1908, went through sev. eds. A few of his many popular detective stories are *Nordenholt's Millions*, 1923, *Murder in the Maze*, 1927, *The Two Tickets Puzzle*, 1930, *The Ha-Ha Case*, 1934, *For Murder Will Speak*, 1938, and *Jack-in-the-Box*, 1944. *Alias J. J. Connington*, 1947, is an autobiography.

Connolly, James (1870-1916), Irish Socialist and rebel, b. near Clones, co. Monaghan. He was the son of a labourer, who in 1880 took his family to Edinburgh. He worked as a 'devil' in the *Evening News* office, then in a bakery and a mosaic-tile factory; then was in turn tramp, navvy, and pedlar. He returned to Edinburgh as corporation dustman.

He joined the Social Democratic Federation and went to Ireland in 1896 as their emissary. He estab. the Irish Socialist and Republican party, lectured in Great Britain and the U.S.A., and returned to Ireland in 1910. With James Larkin he organised a strike of transport workers, 1913. Three years later he took part in the Easter Week rising in Dublin. Captured by the Brit. he was executed at Kilmainham jail, 12 May 1916. See R. M. Fox, *James Connolly: the Fore-runner*, 1947.

Connor, Ralph pseudonym of Charles William Gordon (1860-1937), Canadian clergyman and novelist, b. Glengarry, Ontario. He was educ. at Toronto Univ., studied divinity at Knox College, and was ordained in 1890. From then to 1893 he did excellent work as missionary among the lumbermen and miners in the Rocky Mts, and it is on the experiences gleaned during these years of service and adventure that most of his works of fiction are based. Of his novels the best known are *Black Rock*, 1898; *The Sky Pilot*, 1899; *The Pilot at Swan Creek*, 1905; *The Dawn by Galilee*, 1909. His later works included *The Arm of Gold*, 1933; *The Girl from Glengarry*, 1934; *The Rebel Loyalist*, 1936; *He Dwelt Among Us*, 1936. His *Autobiography* appeared in 1938.

Connotation and Denotation, words used with reference to terms or names. The C. of a term implies certain qualities possessed by the object of which the term is a name. Comprehension and intension are words used to express the same thing. The D. of a term shows how many particular objects the name can be applied to, 'extension' being used as synonymous with D. For example, when the term dog is used the C. of that term implies certain characteristics as to size, hairy coat, shape of the animal, fidelity, and other attributes, and it could not be applied to anything else which did not possess all these attributes in conjunction. That is to say the word dog, when used, calls up certain attributes to anyone hearing the term. The D. of this same term dog is the number of particular animals to which this name can be applied, which, of course, excludes everything not possessing the essential characteristics necessary to place it in this class. The C. of a term determines its D. Thus, when the term dog is used it can be applied to all animals having hairy coats, a particular size, shape, and certain other characteristics. If, however, the C. is increased, the D. is decreased. So the term white dog, which adds another quality, namely white, will apply to fewer animals, as all dogs of other colours will be excluded. All terms have D., but proper names are generally thought to have no C. in that they do not imply any particular attributes.

Conodonts, microscopic translucent toothlike fossils which occur mainly in Palaeozoic rocks. They differ from scolecodonts (the silico-chitinous teeth of polychaete worms) in being composed of calcium phosphate. Though their zoological affinities are uncertain, they are useful as index fossils.

Conolly, John (1794-1866), physician, b. Market Rasen, Lincs. He studied medicine at Edinburgh; M.D., 1821. He practised at Chichester and at Stratford-on-Avon. In 1827 he went to London and was prof. of the practice of medicine at Univ. College from 1828 to 1830, when he moved to Warwick and was appointed visiting inspector to Warwickshire asylums. In 1832 he co-operated with Sir Charles Hastings and Sir John Forbes in founding the Provincial Medical and Surgical Association (afterwards British Medical Association, q.v.). In 1838 he moved to Birmingham and in 1839 to Hanwell, where he was resident physician to the Middlesex Asylum until 1844, and afterwards visiting physician. Here he introduced humane methods of treatment and dispensed with mechanical methods of restraint. His best works were *Indications of Insanity*, 1830; *Construction and Government of Lunatic Asylums*, 1847; *Treatment of the Insane without Mechanical Restraint*, 1856. See memoir by Sir J. Clark, 1869.

Conon: 1. Gk mathematician, fl. at Alexandria about 250 bc. He is said to have named the constellation known as *Coma Berenices* (q.v.).

2. Athenian admiral, played a conspicuous part in the latter half of the Peloponnesian war, when the glory and supremacy of his native city were already waning. In 406 bc he was chosen as one of the 10 commanders who succeeded the fallen Alcibiades. After the disastrous defeat at Aegospotami in 404 bc, C. was obliged to seek refuge with his friend Evagoras, King of Cyprus. When war broke out between Persia and Sparta, C., together with the satrap Pharnabazus, became commander of the Persian fleet, and in 394 regained his former reputation by overcoming the Spartans off Cnidus. But his noblest acts of patriotism were the restoration of the long walls and of the fortifications of the Piræus, and the expulsion of the Lacedæmonian harlots from many of the seaboard garrisons of the Aegean. Some say he d. in Cyprus about 390, others that Tiribazus, the Persian, had him assassinated, when he came on an embassy from Athens, as a proof of his loyalty to Sparta.

'Conqueror,' name of many Brit. battleships. The most famous were those of Boscawen's victory in Lagos Bay (1579), of Byron's action with d'Estaing (1779), and of Rodney's encounters with de Guichen (1780) and de Grasse (1782). There was also a C. at Trafalgar (1805), and at the capture of Simonoseki, Japan (1864). A dreadnought of this name was built in 1911-12 and fought at Jutland (1916).

Conquest (Lat. *conqueri*, to obtain). In Scots law, heritable property which came into a person's possession by purchase, gift, or in any other way unconnected with his capacity of heir, from a stranger, or from a relative to whom he would not by law have succeeded, is called C. But the distinction between C. and heritage proper has been

rendered devoid of practical significance since the Conveyancing Act, 1874, provided that the fees of C. should descend in all respects in the same way as fees of heritage.

Conquistadores (Sp. 'conquerors'), collective term for the Sp. conquerors of America. The title is applied especially to the great leaders who conquered the natives of Peru, Mexico, and other parts of Sp. America, such as Cortés, Bilbao, Almagro, and Pizarro.

Conrad I (d. 918), Ger. king, elected to the throne in AD 911 as the direct line of the Carolingians was extinct. He belonged to a distinguished Franconian family. His reign was a succession of wars. Both the Magyars and Normans from without and the stem-duchies from within effectively opposed his schemes of unification, and later the Bavarians and Swabians waged continuous warfare with him.

Conrad II (c. 990-1039), emperor of the Holy Rom. Empire, and founder of the Franconian or Salian line, was a descendant of Otto the Great. In 1024, on the death of Henry II, C. was crowned king by his chief supporter, the archbishop of Mainz; but he had to deal with many rival claimants. In the following year C. assumed the Lombard crown at Milan, and after defeating the inhab. of Pavia and Ravenna was crowned emperor at Rome in 1027 by Pope John XIX. In 1032 he acquired Lusatia, having worsted the Poles in sev. engagements, and the next year he was duly crowned King of Burgundy at Peterlingen.

Conrad III (1093-1152), Ger. king, and founder of the Hohenstaufen dynasty, was actually chosen King of Italy in 1128, but, finding it impossible to make good his claims against those of Lothaire of Saxony, he finally recognised the supremacy of the latter in 1135. However, Lothaire d. two years later, and in 1138 the Ger. princes, fearing the growing strength of the Guelph party, offered him the crown. During his reign Saxony, Burgundy, and Bavaria were in a state of continuous civil disorder. Meanwhile Italy was also a prey to the quarrels of the Guelphs and Ghibellines and other factions. Subsequently C. went on a crusade, but left Palestine in 1148 broken in health and d. at Bamberg.

Conrad IV (1228-54), Ger. king, was the son of Frederick II. Chosen king in 1237, he subsequently led the anti-papal party on his father's behalf during the Ger. wars. After his father's death (1250), leaving his dominions in a state of anarchy, C. marched into Italy, captured Capua and Naples, and was preparing to return to Germany with a large army when he d. of fever.

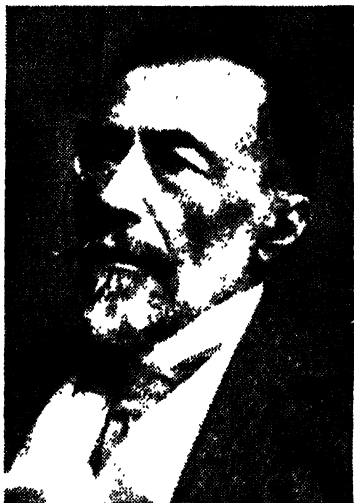
Conrad V, see CONRADIN OF SWABIA.

Conrad, Joseph (1857-1924) novelist writing in Eng. b. at Berdiczew in Podolia, Ukrainian prov. of Poland then under Russian rule. He was the only child of Apollon Nalecz Korzeniowski and his wife Evelina Bobrowska, and was christened Josef Teodor Konrad Nalecz Korzeniowski. His parents were of the landowner class,

and his father was involved in the secret national Polish movement. When C. was 3 his father was arrested and exiled to N. Russia, his wife and child being allowed to go with him under the same conditions of banishment. C.'s mother d. in exile in 1865; 2 years later his father, a sick man, was given conditional parole, and he d. in Cracow in 1869, leaving the orphaned C. in the care of his maternal uncle, Tadeusz Bobrowski. Between the ages of 15 and 17 C. astonished his uncle by expressing a determination to go to sea, a strange calling to people belonging to

in and around the Malay Archipelago and the gulf of Siam. These are, more or less, the scenes of some of his best-known stories: *Almayer's Folly* 1895; *An Outcast of the Islands*, 1896; *The Nigger of the 'Narcissus'*, 1897; *Lord Jim* 1900; *Youth* and *The End of the Tether*, 1902; *Typhoon* and *Falk* 1903; *The Secret Sharer* and *Freyra of the Seven Isles* (pub. in *'Twirl Land and Sea'*, 1912; *Victory* 1915; *The Shadow Line*, 1917; *The Rescue*, 1920; and others. C. became a naturalised Brit. subject on 19 Aug. 1886, and on 11 Nov. 1886 he obtained his master mariner's certificate. His account of his seamanship examinations is given in *A Personal Record*, 1912; which contains, in C.'s revealing yet reticent way, reminiscences of both his life at sea and his youth and ancestry in Poland. His last ship was the *Torrens*, a renowned sailing vessel, which he left in Oct. 1893.

Because many of C.'s stories have a setting of the sea and ships, based very often on his own experiences, he has frequently been regarded as a sea-story writer only; but even those stories most concerned with ships and seamen are grounded in C.'s deep insight into human character and the relation of man's innate waywardness and weakness to the simple virtues of fidelity and courage. In stories like *Lord Jim*, *Youth*, *The Secret Agent*, and *Victory*, indeed in almost all C.'s writings, the reader is brought face to face with man alone against the forces of nature or fate, against evil fellow beings, or against a flaw in his own being. The uniqueness of C. in Eng. fiction owes much to an outlook and temperament peculiar to his origins, and his glowing, convincing writing style to the fact that Eng. was not his native language. He belongs both to romanticism and realism; his descriptions of people and places, rich in colour and simile, make one literally see what is happening, and, for all the grandeur of his language, he can be detached to the point of irony. C. began writing in 1899 (*Almayer's Folly*), while in the Belgian Congo Free State through which he travelled to take command of a riv. steamer; from his experiences there he was physically weakened but psychologically awakened. Years later he gave his Congo story in one of his finest books, *Heart of Darkness*, 1920, which evokes with bitter irony the tragedy of the lost souls, white or black, in that torrid, fever-ridden land in the early days of its 'development.' *Almayer's Folly*, having been read by Edward Garnett, was pub. in April 1895. Encouraged to continue writing, C. settled down to a shore life, marrying Miss Jessie George of London in 1896; they had 2 sons, Borys, b. 1899, and John Alexander, b. 1906. His early books were appreciated by a discriminating public and praised by eminent writers; but none of his books attracted a wide circle of readers until *Chance*, 1913; which has been called the most Eng. of his books, yet is essentially a C. novel both in theme (the 'aloneness' of de Barral, the financial swindler, of his daughter Flora, and of



JOSEPH CONRAD

an inland country and devoted to agric. pursuits, but he persisted and in the autumn of 1874 he travelled to Marseilles to become a seaman. After some experience on 2 sailing ships, he became 1 of a syndicate of 4 young men who bought the 60-ton *Tremolino* and sailed her on contraband activities until she was deliberately wrecked as described in a chapter in *The Mirror of the Sea* (the vol. of *Memories and Impressions* pub. in 1906). More of this phase of C.'s life is told in the story *The Arrow of Gold*, 1919. C.'s first Eng. ship was the *Mavis*, which he joined at Marseilles in April 1878, and it was aboard that vessel that he arrived at Lowestoft 2 months later and saw England for the first time. After some coastal trips in another ship, he joined, as ordinary seaman, a 'wool-clipper' sailing to Australia; returning to London on a steamship in 1880 he passed examination as mate in June of that year. From then on he served as officer on sev. ships, voyaging to many parts of the world, particularly across the Indian Ocean, and

Capt. Anthony) and in construction (the shifting time sequence and the changing presentation from the points of view of different characters, including the 'narrator,' Marlow, who figures in other C. stories). Part of the action of *Chance* takes place at sea, but there are other novels in which the sea plays no part at all, or very little part, and which show to the full his power of penetration into the minds and motives of men, and his great artistry as a constructive novelist. *Nostromo*, 1904, is his longest, and in some ways his greatest novel, the tremendous tale of political intrigue and ambition set around a silver mine on the seaboard of a S. Amer. republic; and 2 stories of revolutionaries and *agents provocateurs* are among his best: *The Secret Agent*, 1907, a sombre, all-comprehending story of conspiracy, attempted outrage, and family murder, set, behind a quiet exterior, in the underworld of Soho; and *Under Western Eyes*, 1911, mainly enacted in Geneva, wherein the Russian exiles of those days lead, in an atmosphere of ideas and ideals, a tragic life of political crime, treachery, and self-punishment. His last 2 novels, *The Rorer*, 1923, and *Suspense* (unfinished and pub. posthumously), 1925, are of the Napoleonic period: set in the Mediterranean, some of the characters have their prototypes in friends of his youthful days. C. lived most of his writing life in Kent, his last house being Oswalds, in the vil. of Bishopsbourne, where his death occurred suddenly, on 3 Aug. 1924. See H. Walpole, *Joseph Conrad*, 1916; F. M. Ford, *Joseph Conrad, a Personal Remembrancer*, 1924; *Life and Letters of Joseph Conrad* (ed. G. Jean Aubrey) 1927; *Letters from Conrad, 1895-1924* (ed. E. Garnett) 1928; R. Curle, *The Last Twelve Years of Joseph Conrad*, 1928; Gustav Morf, *The Polish Heritage of Joseph Conrad*, 1930; R. L. Mégroz, *Joseph Conrad's Mind and Method*, 1931; E. Crankshaw, *Joseph Conrad, Some Aspects of the Art of the Novel*, 1936; *Conrad's Prefaces to his Works*, with introduction by E. Garnett, 1937; M. C. Bradbrook, *Joseph Conrad, England's Polish Genius*, 1941; O. Warner, *Joseph Conrad*, 1951; G. Jean-Aubry, *The Sea Dreamer*, 1957; J. Baines, *Joseph Conrad*, 1959.

Conrad, Michael Georg (1846-1927), Ger. writer, b. Franconia, Bavaria. He studied modern languages and pedagogy, and taught for 3 years in Geneva. Afterwards he became a journalist in Paris and Munich. His literary studies include: *Parisiana*, 1880; *Französische Charakterköpfe*, 1881; *F'ammen für freie Geister*, 1882; *Mme Lutetia und Lutetias Töchter*, 1883; *Von Emil Zola bis Gerhart Hauptmann*, 1902. His impressionist work in the naturalist manner won him the name of 'the foremost apostle of Zola.' Among his novels are *Totentanz der Liebe*, 1884; *Die klugen Jungfrauen*, 1889; *Was die Isar rauscht*, 1889-98; *Fantasio*, 1889; *Majestäät*, 1902, dealing with the relations of Ludwig II and R. Wagner. He also wrote some dramas, and pub. a vol. of poetry, *Salve Regina*, 1899.

Conrad von Hötzendorf, Franz, Baron (1852-1925), military commander under Austro-Hungarian Empire; b. Vienna, 11 Nov. 1852, son of a colonel, served against Bosnian insurrections of 1878 and 1881. A close friend of the Archduke Franz Ferdinand. Appointed chief of general staff, 1906, reorganised artillery. In 1908-9 was for war with Serbia, in 1911 with Italy—overridden by Aehrenthal, in Nov. 1911 was dismissed. Re-appointed, 1912; set pace for First World War after Sarajevo murder. Broke Russians on Galicia front, 1915, made field marshal. Displaced by Emperor Charles, commanded on It. front; was defeated S. of Asiago, 15 June 1917. Retired, a baron. Wrote memoirs, *Aus Meiner Dienstzeit*. D. at Mergentheim, 26 Aug. 1925. See von Glaise Horstenau, *Collapse of Austria-Hungary*, trans. 1930.

Conrad von Würzburg (Würzburg) (d. 1287), famous Ger. poet and troubadour. Little is known of his life, but he seems to have spent some time in Strasbourg, and later in Basel, where he d. He was influenced by Gottfried von Strassburg, and his work reached a far higher level than that of most of the Middle High Ger. poetry of the period. Among his works are legends of Alexius, Silvester, Pantaleon: *Der Welt Lohn*; *Die goldene Schmiede*; *Klage der Kunst*; two long epics, *Der Trojanische Krieg* and *Partenopier und Meliur*. His shorter verse romances are better—*Engelhart und Engeltrut*; *Das Herzemaerre*, familiarised by Uhland's *Kastellan von Coucy*. Examples of his shorter poems may be found in Lambel's *Erzählungen und Schwänke des Mittelalters*, 1883. See Pfeiffer, *Germania*, iii, 1867; Golther in *Allgemeine Deutsche Biographie*, xlv, 1898, under 'Würzburg.'

Conrad, Hermann (1862-90), Ger. writer; studied in Berlin, Leipzig, and Würzburg, and early started upon a literary career. He was a leader of the new 'storm-and-stress period,' and a zealous supporter of the naturalistic tendencies of his time. His sketches, *Brutalitäten und Lieder eines Sünders*, appeared in 1886 and 1887. He also wrote the romance *Phrasen*, 1887, followed by *Wilhelm II und die junge Generation*, 1888. His *Adam Mensch*, 1889, caused a great sensation, and involved C., Walloth, and Alberti in a lawsuit for transgressing public morality. C. was acquitted, but d. during the judicial proceedings.

Conradin of Swabia, or Conrad V (1252-1268), Ger. king, b. near Landshut, Germany, was the last of the Hohenstaufen dynasty, son of Conrad IV. His empire was exposed to the hereditary enemy of the Pope by a long minority under Louis of Bavaria. In 1267, unopposed, and supported by the Ghibelline faction, C. entered Rome, but was defeated at Tagliacozzo in 1268 by Charles of Anjou. He was executed at Naples.

Consaburum, see CONSUBURA.

Consalvi, Ercole (1757-1824), It. statesman and cardinal, b. Rome and educ. at Frascati. He was made a cardinal and secretary of state by Pius VII, and in 1801

he negotiated the Concordat with Napoleon in Paris. His subsequent refusal to be present at the marriage of Napoleon and Marie Louise led to his banishment and dismissal from office. C. was reinstated, 1814-1823, and governed the Papal states liberally and humanely. The Romans named him 'the great cardinal' for all the benefits conferred upon them. C. retired on the death of Pius VII, 1823; he was recalled by Leo XII, and accepted the honorary office of prefect of the college of *propaganda fide*, but d. soon afterwards at Rome. See J. A. M. Crétineau-Joly, *Mémoires du Cardinal Consalvi*, 1864.

Consanguinity (Lat. *cum*, together, and *sanguis*, blood), or kindred, is the relationship between persons of the same blood. This relationship may be lineal or direct, that is, the relationship which subsists between ascendants and descendants who are in a direct line one with the other, or it may be collateral or indirect, that is, the relationship between two persons sprung from a common ancestor, root, or stock, but not descended one from another. Laws of inheritance, descent, and in most countries of marriage are largely governed by the ties of C. They differ naturally according to place and country. Thus in parts of the U.S.A. the C. of uncle and niece does not prohibit marriage as it does in France (according to the Code Napoléon), England, etc., and—to take an example on the opposite side—the canon law would not allow persons to marry between whom there was only the seventh degree of C.

Conscience, Hendrik (1812-83), Flem. novelist, b. Antwerp. At first a soldier and civil servant, he became one of the most popular Flem. writers, whose influence on the literary revival of Flanders was considerable. He wrote more than 100 novels, which have been trans. into most European languages. His historical and sociological novels bear evident traces of Romanticism. He excelled also in his stories of Flem. village life. Among his best known works are *De Leeuw van Vlaanderen*, 1838, *Jacob van Artevelde*, 1849, *Bavo en Lieveken*, 1865, *Kerels van Vlaanderen*, 1870. See E. de Bock, *H. Conscience en de opkomst van de Vlaamse romantiek*, 2nd ed. 1943.

Conscience, knowledge within oneself. In ordinary language and in moral theology C. means the inward recognition of what is right or wrong in one's own actions, a moral sense of consciousness. In ethics, however, it has had various special applications; or rather it has, in various schools of moral philosophy, been regarded from different points of view. Thus it may mean simply an ordinary judgment of one's own conduct, using the same criteria or standards, however gained, as one uses in forming judgments about other things and applying them to one's own actions. It is in this sense a moral consciousness applied to oneself and to one's own actions. On the other hand, it has been pushed to an extreme so that it becomes an intuitive, infallible natural faculty of the mind, a law to itself. The theory that C. is an infallible faculty of

the mind is one tenet of the intuitionist school of ethical philosophy. According to this school, C. as a special faculty at once recognises what is right or what is wrong, whether or no the person acts on its dictates. The part played by C. as a prin. factor in an ethical system has been chiefly discussed and emphasised by the Eng. schools of philosophy. Shaftesbury (1671-1731) drew a close parallel between the sense of beauty and the sense of what is right or wrong: as C. is a faculty in the sphere of art, so also is it a faculty in the sphere of action; it is a moral sense which determines the value of actions; and it is mainly non-reflective. Francis Hutcheson (1694-1746) developed the moral sense; but he tends to separate its working into two parts, one acting deliberately or deductively, one instantaneously or intuitively, a feeling of satisfaction or dissatisfaction according as actions are good or bad. The moral sense, though acting both deliberately and intuitively, is not, however, the standard of judging moral actions; that is, the general well-being of society, the 'greatest happiness of the greatest number.' It is in Joseph Butler (1690-1772) that we find C. developed in an ethical system to its fullest. He analyses the nature of man into the passions or affections: self-love and benevolence and C. The last is a universal principle of reflection, and virtuous action consists in following its dictates; it judges self-love as that which has weighed the passions in the balance and decided which is to its real interest. C. therefore has an absolute power, and it is in the law of our nature, and virtue consists in following it. When analysed further, Butler's C. seems to have no real basis: it does not connect with the will or practical reason. The utilitarian school of ethics dominated Eng. moral philosophy, and the intuitionists, both in the moral sense school and in Butler's C. school, ceased to have influence. Henry Sidgwick in his *Methods of Ethics*, 1874, reconciled the utilitarians and the C. or moral school: the C. or moral sense recognises the general good of the greatest number as the rule of moral conduct. See also ETHICS, and the names mentioned above.

Conscience, Courts of, which were superseded by co. courts, were at one time estab. at Westminster and other commercial centres by local acts of Parliament for the recovery of small debts, usually under £5.

Conscience Money is the term which is given to various sums of money received by the Chancellor of the Exchequer from anonymous persons who have deliberately evaded their obligations, more especially as regards taxes.

Conscientious Objector. This term came into prominence during the First World War, and was applied to those who claimed that they objected on moral or religious grounds to military service in a fighting capacity. Special measures were taken to deal with them in the Military Service Act of 1916 (see CONSCRIPTION), and whilst there was no doubt about the sincerity of the views held by some, there were many who found

in it a convenient excuse to avoid going to the front. Under the Representation of the People Act, 1918, C. O.s were to be disqualified from voting for five years after the First World War unless they satisfied the central tribunal that they had fulfilled certain conditions, such as employment in work of national importance. This provision, however, proved a dead letter, and other penalties imposed on C. O.s, such as loss of seniority in the civil service, were later rescinded. Provision was made in the Military Training Act of 1939 for the exemption of C. O.s on their allocation to some suitable form of national service, but only where the objector could satisfy the court of his bona fides. C. O.s in the Second World War were released from further obligations by the National Service (Release of Conscientious Objectors) Act, 1946.

Conscription. What is termed C., or in other words the compelling every man eligible in the country to make himself efficient for service in the ranks of the national army and take his place therein when necessary, was brought into being in modern times by Napoleon in 1798. It was adopted by Prussia in 1806 after the destruction of its army by the Fr. at Jena, and in that country the system was so perfected that in theory it had, just before the First World War, the most complete fighting machine ever seen. The *modus operandi* in most countries is that every man on reaching a certain age—eighteen, nineteen, twenty, or twenty-one—has to take his place in the ranks and undergo a specified period of military training. In some countries all those liable and found fit to serve are enlisted. This prevailed in Germany before 1914 and prevails in France to-day. The exceptions are mainly only sons or eldest sons of widows, and clergymen, etc. This is not quite the same in all countries; for instance in Spain (prior to the Civil war) and Portugal, where C. is in force, every man is not directly called upon to serve, but each locality is obliged to furnish a certain number, and on a certain day a ballot is taken, and those who draw numbers corresponding to those required are taken if found fit; anyone can find a substitute, and by this means no rich man's son need ever serve. There is no standing army in Switzerland, but every able-bodied citizen serves in the militia, which is called up for ann. service for a few weeks. The best conscriptive countries have so legislated that suitable work is found for the conscript when he leaves the colours, and, furthermore, his period of service is never so long as that of men in a voluntarily enlisted army, such as the Regular Army of Great Britain. Arguments in favour of and against C. will be found in Lord Roberts, *Fallacies and Facts*, etc., 1911, and Ian Hamilton's *Compulsory Service*, 1910. In the First World War, when whole nations as well as their armies soon became involved directly or indirectly in the struggle, the voluntary system of recruiting the armies of necessity broke down. Under that system in England thousands of young men at once responded to

appeals and patriotically left their homes and businesses. Others in far distant corners of the earth also returned to Great Britain, prompted by the same motive. But it was only a matter of time before this spontaneous supply was exhausted and other measures had to be taken to recruit field armies at all commensurate with the vast and growing extent of the military operations. In 1915 there was agitation in Great Britain in favour of C., but Parliament hesitated to adopt an institution which had always been repugnant to Brit. tradition. Lord Derby was then appointed to direct the recruitment service according to a plan which involved an element of compulsion by the introduction of tribunals to decide the appeals in individual cases, enlistment being a condition precedent to any right of appeal. This method was successful up to a point, but the supply of unmarried men, upon which the 'Derby Group System' at first mainly relied, soon gave out, and at length Parliament agreed to compulsory service and the first Military Service Act was passed early in 1916. This brought into operation a universal machinery for sifting the manhood of the nation and for hearing appeals for exemption. As the war continued other Acts were brought into force which had for their object the finer 'combing' of the nation as one source after another was drained.

In the U.S.A. those who had closely studied the effect of the war upon the man-power of Great Britain were not slow to advocate some form of compulsory service as soon as war was declared against Germany. In May 1917 the Selective Service Act was passed, under which 1,000,000 men were authorised to be enlisted for 'selective service.' As in Great Britain, the process of passing the men through the medical and physical tests disclosed many surprising facts regarding the general fitness for military service of millions of Amers. With the armistice compulsory service in the U.S.A. and Great Britain ceased.

In view of the threatening situation in Europe in 1938-9 the Brit. Gov. in April 1939 decided to introduce a system of compulsory military training as necessary for the safety of the country and the fulfilment of undertakings given to certain countries in Europe (France, Poland, Greece, etc.). The fact was that no one seriously doubted but that Germany, under the domination of the Nazis, was aiming at the hegemony of Europe and that no time was to be lost in improving the nation's military resources. At this time there was Labour and Liberal opposition to C., both parties opposing the Military Training Bill, 1939, on the ground that the Prime Minister, Mr Neville Chamberlain, had 'violated' his pledge and that C. was not necessary; but what weighed most with Labour was the fear that military compulsion might be extended into industrial compulsion, which, in effect, is precisely what did happen in 1940 when, in the face of great national danger, the Ministry of Labour

and National Service was empowered in the national interest to direct persons to various employments. The third reading of the Military Training Bill, 1939, was carried by 283 votes to 133. The general council of the T.U.C. co-operated with the gov., and the T.U.C., while still condemning compulsory military training, authorised trade unionists to serve on committees and tribunals to be set up under the Bill. Under Acts passed in 1939 and 1940 the gov. conscribed men between 20 and 41 for both military and industrial service, and women between 20 and 30 for industrial service. It was at liberty, under the Emergency Powers Act of 1940, to go even beyond these limits, but it preferred not to do so without receiving express permission from Parliament. For this purpose Mr Churchill, on 2 Dec. 1939, moved in the Commons that the obligation for national service should be extended to include the resources of woman-power and man-power still available. The reason for the crisis was that the great supply plants had now largely been built and it was urgent that they should be fully staffed. Among changes he now proposed were to raise the age limit for military service from 41 to 51 and to lower the minimum limit from 20 to 18½, at the same time making recruits of 19 liable for service abroad. Boys and girls between 16 and 18 were also to be registered, with a view to enrolment in various youth organisations. Regarding women, the gov. proposed to take powers to draft unmarried women between 20 and 30 not only into industry but also, under certain limitations, into the women's auxiliary forces: the Women's Royal Naval Service, the Women's Auxiliary Air Force, and the Auxiliary Territorial Service. On 9 Dec. the minister of labour moved the second reading of the new National Service Bill which embodied the proposals outlined by Mr Churchill. National service under this Bill included service in the armed forces, civil defence, and industry. Civil defence included the Police War Reserve, the National Fire Service, and the Civil Defence Reserve, but the minister of home security could add any organisation he deemed fit. The idea of conscribing women for military service was repugnant to some members, and an amendment was moved to exclude them from the scope of the Bill; but this was rejected without a div. and the Bill passed its remaining stages without opposition. Under legislation enacted before Sept. 1939, power existed in Australia and in the Union of S. Africa to require all men to render military service in time of war. Similar legislative provision was made in Canada and New Zealand after Sept. 1939. Men were called up under these provisions in Canada, Australia, and New Zealand. In 1945 they were no longer being called up in Canada or New Zealand and only boys of 18 were then being called up in Australia. Powers were also taken in many other parts of the Empire to call up men for military service, and were used in varying degrees.

The National Service Act, 1947, introduced a scheme of compulsory service in the armed forces for all male Brit. subjects between the ages of eighteen and twenty-six, to operate from 1 Jan. 1949, by which date the existing transitional arrangements had ended. National service men, or, in other words, conscripts, served eighteen months whole time or with the colours, and five and a half years in the reserve, with a period of ann. training. A further Act passed in 1950 increased the period of full-time service to two years but reduced the reserve liability to 3½ years. The Defence White Paper issued in 1957 set as an objective the ending of compulsory service in 1962.

In the U.S.A. President Roosevelt on 30 May 1940 stressed the need to train Amer. manpower for the forces and industry. A Bill for selective training and military service, sponsored by the National Emergency Committee, was introduced into Congress in June (1940). It proposed registration of all men from 18 to 64, numbering 40,000,000, of whom men between 21 and 45 would be eligible for 8 months' compulsory military training, those chosen being selected by lot. Both Gen. Marshall, chief of staff, and war secretary Stimson advocated compulsory military service as soon as possible. The Bill, however, made such slow progress in the Senate Military Affairs Committee that Roosevelt declared (2 Aug.) that he favoured a selective training Bill and described C. as the fairest and most effective means of obtaining man-power. He said that the 13 months' leeway in 1917-18 during which the U.S.A. had been luckily able to build up an army of 4,000,000 men without attack from a foreign power would never happen again. The National Defence Advisory Commission supported the Military Training Bill, which was at length passed (with amendments) by the Senate Military Affairs Committee on 5 Aug. Amendments restricted the registration age from 21 to 31 years of age, in place of from 18 to 64, which would have affected over 40,000,000 men. With the restricted age-groups a total of 12,000,000 were affected, but deducting workers in essential industries and agriculture and men with dependants, only 4,500,000 remained for immediate selection. The Bill was enacted on 19 Oct. (1940). In the House of Representatives the Military Affairs Committee adopted C. as applying to all men between 21 and 45 but omitted any provision for the C. of industry. Final approval was given to the Bill in the House on 7 Sept., after it had reaffirmed an amendment to defer its operation for 60 days. But in the Conference Committee of both Houses unanimous agreement was reached on 18 Sept. on the main controversial points, including the deferment amendment, which was dropped, thereby enabling the first 400,000 men to be called up as soon as the registration machinery was ready. The conference adopted amended provisions for the C. of industrial plant to the effect that a manufacturer must accept and execute on 'fair

and just' terms orders for national defence materials when called upon to do so by the President. The conference report was finally approved by both Houses on 14 Sept. On 16 Sept. President Roosevelt signed the Bill. The 1940 Act was superseded by a Selective Service Act passed in 1948. This last was in turn replaced by a Universal Military Training and Service Act adopted in 1951. Under the 1951 Act men reaching the age of 18½ years can be drafted for a period of 2 years' service. See D. Hayes, *Conscription Conflict*, 1949.

Consecration, making sacred, the solemn appropriation or dedication of any thing or person to the service of God. The C. of the clergy is called *ordination* except in the case of bishops. The C. of members of religious orders is named *profession*. In the Old Testament not only men and beasts were consecrated to the Lord but also houses, fields, and the walls of Jerusalem (Lev. xxvii.; Neh. xii. 27). At the exodus from Egypt the first-born males in Israel, whether of man or beast, were sanctified to God, i.e. were consecrated or devoted to Him for sacrifice, the children, however, being redeemed (Exod. xiii.). In Christian ecclesiology C. is resolvable into (1) the dedication of persons or things to the service of God with appropriate ceremonies; (2) the formal declaration that in consequence of being devoted to God they are now sacred; (3) the imparting in the case of some persons (e.g. by ordination) of spiritual character and powers. In the context of the Eucharist the term is used (4) for the blessing of the bread and wine, which in Catholic and Orthodox theology effects a substantial change in them (see EUCHARIST; MASS; REAL PRESENCE; TRANSUBSTANTIATION). The term C. is used for the ordaining of bishops, and for the hallowing of altars, chalices, patens, etc., but especially of churches. Christianity had prevailed for some time before separate buildings were erected for divine worship; when these were erected simple rites of C. followed, and by the time of Constantine these rites had developed into numerous and imposing ceremonies.

In England, the legal effect of the formal C. of a church by a bishop is that it can only be used for sacred purposes. If desecrated by an act of sacrilege, it needs to be blessed again; but it cannot be sold or put to secular use without lawful authority, and even an Act of Parliament, in the case of the Estab. Church. For that reason buildings required only for temporary use are often not formally consecrated, but blessed in a lesser degree known as dedication. In a dual-purpose building, used both as church and parish hall, sometimes the sanctuary only is dedicated and partitioned off. For burial ground see BURIAL ACTS.

Consequina, see COSEQUINA.

Consent, a defence in certain criminal offences involving assault (e.g. rape) unless obtained by fraud or duress. C. is no defence to a charge of incest, or to the abuse of a female lunatic, or to a charge of

indecent assault on any young person under the age of 13. In the Scots law of contract, following the Rom. law of consensual contracts, some contracts may be binding by mere C. without other formalities. Such contracts include partnership agreements, sale, barter, location (hire), and mandatum (bailment). For its legal connotation as a synonym for collusion in the law of divorce, see COLLUSION.

Consentia, see COSENZA.

Conserans, see COUSERANS, LE.

Conservation, Soil, see SOIL EROSION, also IRRIGATION; ORGANIC HUSBANDRY.

Conservative Club, see CLUBS.

Conservative Party, name of one of the chief Brit. political parties. The name implies that the essential characteristic is that its purpose or tendency is to maintain and preserve existing institutions. It was first given by J. W. Croker in the *Quarterly Review*, Jan. 1833, as a more appropriate term than Tory (q.v.). It was not at first welcomed by members of the party. The disruption of the Liberal party at Gladstone's first Home Rule Bill led first to the formation of the Liberal Unionist party, the name adopted by those Liberals who dissented from the policy; when these joined with the C.s in Lord Salisbury's first gov., the name Unionist was used for both wings of the new party. In 1912 the two separate party organisations coalesced, and Unionist became the formal accepted name for the former Liberal Unionist and C. P.s; but with the grant of dominion status to Ireland (see IRISH FREE STATE) the alternative name Unionist has been dropped, except in Ulster and to some extent in Scotland. The C. P. are the lineal descendants of the Tory party as re-modelled by Disraeli, who may be regarded as the founder of modern Conservatism. He foresaw the need for party organisation, and after the second Reform Act, 1867 (which gave the vote to workers who were householders), he inspired the formation of local associations. It was Disraeli who strengthened the party machine by the creation of the Conservative Central Office in 1870.

The hist. of the Tories goes back to the Restoration, but it is only towards the end of the 18th cent. that the party system begins to assume a form anything like that of to-day. The Tory party of the 18th cent. was long in humiliating opposition, a consequence of the Jacobite leanings of its leader, Viscount Bolingbroke. Branded for 50 years as Jacobites, the Tories were not favoured by Hanoverian sovereigns, whose first minister was always a Whig. But during the Amer. war the party was re-created, Tory and sovereign taking the common if illusory view that the Amer. colonies should remain part of the Brit. Empire. Thereafter for the next 2 decades the outstanding features of the Tory regime were the Six Acts, passed to meet the difficult social conditions following Waterloo, and the Catholic Emancipation Act of 1828. Then came 10 years of opposition until Peel led the Tory administration of 1842, with Gladstone as

his lieutenant. It was on the rock of the Corn Laws that the party finally foundered. Disraeli was opposed to the repeal of these laws; with Derby he led the Young England party, the germ of the modern C. P. (see under BEACONSFIELD), and Peel was forced, in 1846, to embrace free trade; but eventually the Tory party turned against him over the Coercion of Ireland Bill, which was thrown out. With Gladstone Peel then went over to Lord John Russell's group; the split was complete; and Disraeli was left to re-organise the remains of the party. To Disraeli, who consistently supported Lord Ashley in his factory reforms, is due the marked progress in social legislation and the lead in imperial policy, resulting in drawing the self-governing dominions into closer alliance with the mother country, which have been the salient features of Conservatism in recent years.

The aims of the C. P. as stated by Disraeli are 'the preservation of our institutions, the maintenance of our empire, and the amelioration of the condition of the people.' These aims summarise a whole policy, and indeed they still represent the aspirations of modern Conservatives. The present Prime Minister, Mr Harold Macmillan, in acknowledging his election as Leader of the Party, used Disraeli's phrase to describe the party's standpoint: 'We must be conservative to conserve all that is good and radical to uproot all that is bad.'

Between the two world wars, except in 1924 and 1929-31, the C. P. was either in power or forming the dominating group in 'National' govts. A good deal of social reform was carried out, and a protectionist trade policy, based on imperial preferences, adopted in 1932. The C. P. obtained a large majority at the general election in 1935, but Baldwin and his successor, Neville Chamberlain (q.v.), found themselves in growing difficulties with a certain section in their party over re-armament and the Hitler threat. Anthony Eden (q.v.) had resigned in 1938 following a difference over policy, and Churchill (q.v.), who had pursued an independent line for some years, continued to oppose Chamberlain and in particular denounced Munich. When the Second World War broke out Chamberlain called on Churchill and Eden for support.

In 1940 Chamberlain resigned and a Coalition gov. took office, with a Conservative, Churchill, as Prime Minister; but in the general election in 1945 the party was heavily defeated and went into opposition. Between 1945-50 the C. P. reviewed its policy and pub. documents like the 'Industrial Charter' which modernised its constructive thinking, although its members would claim that its essential principles remain unaltered. It gained many seats at the general election in 1950, virtually wiping out the Socialist majority, and at the general election in 1951 regained power. In 1955 Eden, Churchill's successor as Prime Minister and party leader, increased the C. majority in the general election, an

almost phenomenal achievement for a party in power.

The modern Conservative party, while opposed to State ownership and its extension, has not repealed the Acts of its predecessors except in the cases of steel and road transport. It abolished rationing and repealed the numerous controls left over from the war. Its general economic outlook is bound up with free enterprise. It maintains full employment and safeguards social security, of which it was part author during the period of Coalition. In imperial policy it is assisting colonies to advance to self-government and full nationhood. See Earl Birkenhead, *Toryism*, 1903; Geoffrey Butler, *The Tory Tradition*, 1914; W. F. Money Penny and G. E. Buckle, *The Life of Benjamin Disraeli, Earl of Beaconsfield*, 1910-20; André Maurois, *Life of Disraeli*, 1927; Lord H. Cecil, *Conservatism*, 1928; Arthur Bryant, *The Spirit of Conservatism*, 1929; Blanche E. C. Dugdale, *Arthur James Balfour* (2 vols.), 1936; L. S. Amery, *The Framework of the Future*, 1944; Quintin Hogg (Lord Hailsham), *The Case for Conservatism*, 1947; Winston S. Churchill, *Life of Lord Randolph Churchill* (new ed.), 1952.

Conservators of the Peace, predecessors of the modern justices of the peace, but invested with powers far inferior to those of the latter. They were the authority to take sureties for peace and good behaviour.

Conservatory (Fr. *conservatoire*, lt. *conservatorio*), name originally given to schools founded, mainly in Italy at first, to maintain and educate orphans and illegitimate children (Lat. *conservare*, to preserve). Music was an essential part of the education, and thus many of these charitable institutions became virtually music schools, and later their name transferred itself to such schools. The first for which a definite date is given was the Conservatorio di Santa Maria di Loreto in Naples, founded in 1537, and among three other similar schools afterwards estab. in the same city was the Conservatorio di Sant' Onofrio, noted for its teachers, such as Alessandro Scarlatti and Durante. Of these four Murat united the two remaining into the Ireal Collegio di Musica for pupils of both sexes. In Venice there were sev. C.s for girls at an early date, but these disappeared with the decline of the Venetian rep. and the centre of musical training for N. Italy was transferred to Milan, where a large C. was estab. in 1808 by Prince Eugène Beauharnais. The École Royale de Chant et de Déclamation was founded in Paris (1784) for training opera singers. During the revolution the Institut National de Musique was erected (1793), the name changing to Conservatoire de Musique (1795). Another famous continental institution is the Conservatorium at Leipzig, founded by Mendelssohn (1843). Other important European C.s (including those in existence before the Second World War) are at Prague (founded 1811), Vienna (1816), Brussels (1833), Cologne (1849), Munich, Stuttgart, and Berlin (founded by Joachim 1869).

Corresponding Eng. institutions are the Royal Academy of Music (founded 1822, incorporated by charter 1830), the Royal College of Music (1882), and the Guildhall School of Music (1880). The chief in U.S.A. is the National Conservatory of Music of America (New York, 1885). There are 2 in Boston (1867, 1870).

Consett, urban dist. and tn. of co. Durham, England, 12 m. from Durham. There are extensive iron works (first started in 1837) and coal mines, and some farming and horticulture is still carried on. Included in the dist. are Shotley Bridge, famous in the 18th cent. for sword-making by Ger. cutlers; Medomsley, whose par. church dates from the late 12th cent.; Iveston; Leadgate; and Ebchester, on the site of a Rom. camp, with an 11th-cent. par. church built of Rom. stone. The author Surtees (q.v.), creator of 'Jorrocks,' was b. at Hamsterley. Pop. 38,900.

Conshohocken, bor. of Montgomery co., Pennsylvania, U.S.A., on the Schuylkill R., 13 m. from Philadelphia. Founded in 1830, it was incorporated as a bor., 1852. It has large cotton, woollen, and rolling mills, foundries, furnaces, surgical instrument works, stone quarries, steel mills, and boiler shops. Pop. 10,922.

Considérant, Victor Prosper (1808-93), Fr. Socialist, b. Salins, the chief advocate of Fourierism, gave up his career in the army to devote himself to propagating his political beliefs. He ed. the *Phalange* and *Phalanstère*, journals setting forth Fourier's views. Having obtained financial assistance from an Englishman, Young, he estab. a socialist colony in the dept. Eure-et-Loire, 1832, but the experiment failed. In 1854 he went to Texas, and founded a socialist community, La Réunion, near San Antonio, but this enterprise also ended in failure. He returned to France, 1869, and d. in obscurity. His socialism was based on voluntary co-operation, and was not revolutionary in character. Among his works are *La Destinée sociale*, 1834-8, dedicated to Louis Philippe; *Débatte de la politique*, 1836; *Principes du socialisme*, 1847.

Consideration. All contracts not under seal require valuable C. to make them enforceable. The generally accepted legal definition of valuable C. is 'some right, interest, profit, or benefit accruing to one party, or some forbearance, detriment, loss, or responsibility given, suffered, or undertaken by the other.' A specialty contract (i.e. one under seal) is said to require no C. because of the legal dogma that a deed imports C., a fiction which probably owes its origin to the peculiar sanctity that has attached to deeds (or charters as they were once called) from the earliest days of the Eng. legal system. No simple contract can be enforced unless supported by valuable C. For example, A promises verbally or in writing not under seal to give B £100 for no C.; B cannot enforce the promise against A. Again, A owes B £100, and pays him £75 which B accepts 'in full satisfaction.' B can, none the less, sue A for the remaining

£25, though it would be otherwise if A had paid £75 and given in addition some article, however trifling, by way of C. C.s are sometimes divided into valuable and good C.s. A good C. is that of natural affection between blood-relations, but it is not sufficient to maintain the validity of a conveyance of property against the claim of a subsequent purchaser for value. C. need not be adequate to the promise offered by the other party to a contract, but must be of some value; it must be legal, e.g. money loaned to gamble in differences on the Stock Exchange could not be recovered (see DIFFERENCES); and it must not be past, but must be either present or future (see also EXECUTORY). As a corollary of the above rules it is to be noted that neither motive nor moral obligation amounts to C., therefore if A saves B's life and B afterwards promises A £100 out of gratitude, A cannot recover the money from B or out of B's estate. Lastly C. must move from the promisee, which may be differently expressed by saying that no stranger to the C. can take advantage of a contract though made for his benefit (see CONTRACT). See G. C. Cheshire and C. H. S. Fifoot, *The Law of Contract*, 1956.

Consignment, commercial term used of the dispatching of goods for delivery to a purchaser; it is particularly used in the shipping of goods. The person dispatching goods is the consignor, and the person to whom they are dispatched is the consignee. See BILL OF LADING.

Consistory Courts, which were founded by William I, now exist in every diocese of England. They are eccles. courts controlled by chancellors appointed by a bishop or archbishop. Their business is now almost restricted to the dispensing of faculties for which application is still made according to forensic procedure. Until the Act of 1857 they assisted in exercising jurisdiction over testamentary and matrimonial disputes. By an Act of 1892 a clergyman accused of immorality may be tried in a consistory court.

Consolato del Mare, see CONSULATE OF THE SEA.

Console, in architecture, an ornamental bracket (see also MODILLION).

Consolidated Fund, the fund of the national exchequer comprising the produce of the extraordinary revenues of the Crown. The fund was so named from the fact that it was consolidated out of what previously had constituted distinct funds—the aggregate, the general, and the S. Sea funds. It was first formed in 1786, and afterwards by the 56 George III c. 98 the Irish exchequer was amalgamated with it, and it then became the C. F. of the United Kingdom. The whole of gov. expenditure is met from the fund, including supply services and the interest of the national debt. In addition, the annual provision for the Queen's civil list, the salaries and pensions of judges and other officials are paid out of the fund. The receipts which go to make up the C. F. are taxes and other revenue items, the proceeds of all gov. borrowing,

repayments, advances, etc. The main heads of revenue comprise the following: customs (q.v.), excise (q.v.), death duties (q.v.), stamp duties, income tax, surtax, profits taxes, post office receipts, and miscellaneous items. These various receipts are all paid to the Exchequer account at the Bank of England, and may not be paid out except by statutory authority. See W. R. Anson, *Law and Custom of the Constitution*, 1888-92.

Consolidated Goldfields of South Africa. This company was formed in 1892 by the amalgamation of other similar undertakings, of which Cecil Rhodes (q.v.) was the leading spirit. It originated as the Goldfields of S. Africa Company, formed by Cecil Rhodes and Charles Rudd to exploit concessions given by Lobengula, the famous Matabele king.

Consolidation Acts, or Consolidation of Statutes, species of codification, or digest. The avowed object of a Consolidating Act is to incorporate in one repealing Act all the existing law on any one topic, together with necessary amendments, but otherwise without making any change in the pre-existing law whether statute or common law. Many C. A., however, either from faults inherent in draughtsmanship, or from the difficulty of giving adequate expression to ill-considered amendments, fall short of accomplishing this ideal; and, further, many sections being really based upon the *rationes decidendi* (principles of decision) of reported cases either do not give effect to the spirit of the decision, or fail of universal application, either because the decision was appropriate only to the facts of the particular case or because the necessary elimination of those facts in the section renders the statutory language ambiguous. Examples of C. A. are the Criminal Law Consolidation Acts, 1861, Bills of Exchange Act, 1882; the Sale of Goods Act, 1893; Children Acts, 1908-33; Companies (Consolidation) Act, 1929.

Consols, consolidated annuities (see CONSOLIDATED FUND). An Act of 1731 consolidated certain perpetual and lottery annuities bearing interest at 3 per cent, and these consolidated annuities formed the basis of the C. The interest on C. was reduced in 1888 to 2½ per cent, and in 1905 to 2¼ per cent. The value of these C. when first issued against existing securities was £9 m., but this amount was increased later to over £400 m. By 1888 this figure had been reduced by purchase in the market and by conversions into terminable annuities to £323 m. In 1889 Goschen, the Chancellor of the Exchequer, redeemed this stock. Since the First World War C. have formed a small part of the total national debt of Great Britain. The term C. has in late years been applied to certain other securities, such as New Zealand 5 per cent C. These are so named by dealers on the exchange because the word is less cumbersome than consolidated stock.

Consonance, in music, see CONCORD.

Consort, see CHAMBER MUSIC; CONCERT.

Consort (Lat. *consors*, partner, sharing in), literally one who throws in his lot

(*sors*) with another. In Eng. constitutional law the term is applied to the husband or wife of the reigning sovereign, viewed in a public capacity, as sharing to a certain extent in the royal prerogative. The title has been familiar in England since it was conferred on Prince Albert in 1857 by letters patent. A consort is a subject of the sovereign, and may be guilty of treason against the latter. A queen consort is entirely independent of her husband's control, and is regarded in legal proceedings as a *feme-sole*. She has her particular revenue, and certain exemptions and privileges. See ROYAL FAMILY.

Conspicuous Gallantry Medal, instituted for award to men of the Royal Navy and Royal Marines who performed exceptional acts of bravery in action during the Crimean war. In 1874 it was re-instituted for award for similar purposes and made applicable to any campaign. It is virtually the naval counterpart of the military Distinguished Conduct Medal.

Conspicuous Service Cross, Brit. decoration, instituted in 1901. See DISTINGUISHED SERVICE CROSS.

Conspiracy may be defined in law as an agreement between two or more persons to do an unlawful act or to do a lawful act by unlawful means. Much obscurity has always characterised what seems now to be definitely regarded as a substantive offence. The difficulty in principle lay in the confusion arising from the fact that, generally speaking, nothing can be unlawful, civilly or criminally, in two or more persons which would not be unlawful if done by one person, or if done without such previous agreement. The substantive wrong of C. was really developed as an action on the case (q.v.) or, in other words, was inducted from the consequential damage generally following on a conspiratorial agreement. Something more was required, however, than the mere fact of damage, for damage *sine injuria* (q.v.) is necessarily no wrong, and the injurious element was deduced generally from the fact that such agreements as were held to be C.s were characterised by some ultimate malicious object or wrongful means of execution. While, therefore, defining C. in the above manner it must always be remembered that to agree to persuade a man, *without unlawful means*, to do something he has a right to do, or to abstain from doing what he has a right to abstain from doing, can never be actionable, although done to the prejudice of a third person, and although done with a malicious motive. C. as a criminal offence is classed by text writers under three heads: (1) where the end is in itself a crime; (2) where the means are unlawful but the end is lawful; (3) where the end is to injure a third person or a class, though, if the wrong were inflicted by a single individual, a civil wrong only and not a crime would be committed. The whole gist of C. is the *combination*, so that a single person could only be convicted if his fellow conspirators were either dead, unknown, or not in custody for some

reason or other. It is now settled law that agreement by two or more persons to do certain acts may be criminal, although those acts if done by one person might not render him liable to any proceedings whatever. It is clear, e.g., that numbers may coerce and intimidate where a single individual could effect nothing. In regard to (1) above, a C. to commit murder is dealt with by a statute which makes it punishable with imprisonment up to ten years. Unlawful interference with trade by combinations and especially by combinations of workmen against employers form the most striking example of C.s under (2). Workmen may lawfully combine to protect their interest, but may not, theoretically at all events, interfere with the right of such of their class as do not wish to join the combination. The Conspiracy and Protection of Property Act, 1875, expressly makes punishable as crimes by imprisonment not exceeding three months, or a penalty not exceeding £20: (a) coercion of a person by violence or intimidation manifested either towards himself, his wife, or children, or his property; (b) persistently following a person about from place to place; (c) hiding his tools or other property; (d) picketing, i.e. watching or besetting a person at his house or place of business, or the following a person about in the streets in a disorderly manner by two or more persons. This has been altered by the Trades Disputes Act, 1906, which allows peaceful picketing for the purpose of communicating information by persons acting in furtherance of a trade dispute; (e) wilful and malicious breaking of his contract of service by an employee of a gas or water company, with the knowledge that such breach will cause a failure of gas or water; (f) wilful or malicious breach of contract endangering human life, or tending to cause serious bodily injury or expose valuable property to destruction. By the combined operation of section 3 of the Act of 1875 and section 1 of the Act of 1906, trade disputes stand above the ordinary law in some of their probable consequences; for if, in connection with such a dispute, two or more persons combine to do an act which if done by a single individual would not be punishable criminally, they will not, merely because of their number, be liable either to criminal proceedings or to a civil action. *See also* COMBINATION, LAWS OF. *See F. Pollock, The Law of Torts*, 1929; Sir W. O. Russell, *Crime: a treatise on felonies and misdemeanours*, 10th ed. by J. W. C. Turner (2 vols), 1950.

Constable, Archibald (1774-1827), founder of the *Edinburgh Review*, 1802, which he managed for 24 years, and indirectly of the publishing firm which still bears his name. He pub. Scott's first original work in 1805, and gave him £1000 for *Marmion* (1807). C. & Co. also pub. most of Scott's prose works from 1813 to 1826. In 1825 C. failed for about £250,000. This failure, together with that of the printers, Ballantyne & Co., involved Scott in the heavy loss of £120,000. C. purchased the copyright of

the *Scots Magazine* in 1801, and the copyright and stock of the *Encyclopaedia Britannica* in 1812. *Constable's Miscellany* was started in 1827. *See J. G. Lockhart, Memoirs of the Life of Sir Walter Scott, Bart.*, 1837-8, and Sir L. Stephen's biography of Scott in the *Dictionary of National Biography*, 1882-91.

Constable, Henry (1562-1613), Eng. poet, graduated from St. John's, Cambridge, 1580. He early turned Rom. Catholic, and spent much of his time abroad in Paris. In 1598 he was trying to form a new Eng. Catholic college in Paris. C. came to London without permission, 1603, and was confined in the Tower for about a year. He was a friend of Sidney, Harrington, and Bolton. His *Diana: the Praises of his Mistress in certain sweet sonnets* was pub. 1592, and is a series of 23 sonnets, praised by Jonson and others. C. also wrote 16 *Spiritual Sonnettes to the Honour of God and his Sayntes* (those were first printed by T. Park from MS. in 1815), and *The Shepherds Song of Venus and Adonis*, in *England's Helicon*, 1600. W. C. Hazlitt collected his works in 1859.

Constable, John (1776-1837), landscape painter, was the son of a mill-owner of E. Bergholt, Suffolk. Even in the days when he attended Dedham Grammar School all his spare hours were devoted to painting. Thus, although he was at first sent to work in the windmill, his father soon yielded to his passion for art, which had been fostered by his friendship with Sir George Beaumont and by his study of Claude's 'Hagar and Ishmael,' and in 1795 allowed him to go to London to consult Joseph Farington, R.A., whose modern fame has been established by the discovery of his MS. diary in 1921. The final result of this visit, during which he was taught etching by J. T. Smith (q.v.), was that in 1799 he entered the Royal Academy schools, and definitely embraced the career of painting. Three years later he exhibited for the first time at the academy. In 1816 he married Mary Bicknell, after a weary period of waiting due to the opposition of her relatives. The year 1819 is important not only as the date of his election as an associate of the Royal Academy, but also as that in which he received £8000 in legacies—a timely gift which considerably relieved his monetary anxieties. Two years later he gained a gold medal at the Paris Salon for his splendid picture 'The Hay Wain,' and in 1825 he won another at the Lille exhibition for his 'White Horse.' His financial position was finally estab. in 1828 by an inheritance of £20,000 from Mr Bicknell, but any gratification he might derive from this gift was at once swallowed up in the inconsolable grief which he felt at the loss of his wife in the same year. He never recovered from the shock of her death, and his own death in 1837 was due as much to nervous depression as to any physical weakness. The greater part of his life had been spent in London, latterly at Hampstead. His work may be studied in the national collections at Trafalgar Square, S. Kensington, and Millbank. Like

most young painters, he began by observing 'truth at second hand,' copying Claude and Ruysdael and imitating the technique of Girtin, Gainsborough, and the old Dutch masters. This period of apprenticeship lasted till 1806, the year of his visit to the Eng. lakes. The altar-piece which he executed in 1804 for Brantham church is in the manner of Benjamin West, at that time president of the Royal Academy, and a kind patron to C. From 1806 to 1809 he was for the most part engaged in copying portraits by Hoppner and Reynolds,



N. P. G.

JOHN CONSTABLE

From his self-portrait.

and seriously studied the science of oil-painting. The turning-point in his career was his exhibition of 'Dedham Vale' in 1811, in which he first gave his talent free scope and began to develop his striking originality. C. was thus a long while reaching his artistic maturity. His range of subjects was limited, being mostly restricted to the scenery of Suffolk, Salisbury, Hampstead, and Brighton, but he really knew the old mills and rustic bridges, the great trees and waterways, the corn-fields, and above all the skies that he depicted. His experience as a miller must have taught him to study the clouds: at least he is unequalled in his presentation of the sky in April before a heavy shower, or of the lowering clouds that presage the storm's approach. Truthfulness is the salient feature in his detail, his broad composition, and his atmospheric effects. His pictures seem to breathe the life of the farmyard and

the fields. Their fresh, natural colours are not the least of their merits. In his vivid tones C. was following the example of Rubens and Claude, so that it is untrue to regard him, as was not infrequently done, in the light of an opponent of the old masters. His technique influenced Delacroix, Corot, and indirectly the French impressionists, and modern criticism values highly his small swift sketches made from nature for their directness of handling. C.'s reputation rests on his faithful portrayal of the beauties of Eng. landscape and rustic life, and especially of the light-and-shade effects of rain clouds through which the sun's rays are doing their best to penetrate. It is a pity that Ruskin in his admiration of Turner and the Pro-Raphaelites should have been blinded to the true greatness of C. High prices are given for his pictures. Thus 'Dedham Mill' was sold in 1848 for £550; and a free study in pencil by C. for his picture 'The Leaping Horse' was sold in the same year for £40. The mezzotints of David Lucas (1855) are among the finest engravings after C. Among his many pictures are 'The Leaping Horse,' 1825, perhaps his masterpiece; 'The Cornfield,' 1827; 'Dedham Vale,' 1828; 'Hadleigh Castle,' 1829; 'Salisbury Cathedral,' 1831; and 'The Valley Farm,' 1835. See C. R. Leslie, *Memoirs of the Life of John Constable*, 1843; C. J. Holmes, *Constable and his Influence on Landscape Painting*, 1902; A. B. Chamberlain, *John Constable*, 1903; H. W. Tompkins, *In Constable's Country*, 1906; E. V. Lucas, *John Constable, the Painter*, 1924; S. Key, *John Constable, his Life and Work*, 1948.

Constable (from Late Lat. *comes stabuli*, count of the stable, marshal), word of widely different meanings in different countries and at different periods in the same country: (1) In France. In the Middle Ages the C. of France had the chief command of the army and jurisdiction in military offences; he also had the control of all matters relating to chivalry. One of the most celebrated holders of the office was Bertrand du Guesclin. The office was finally abolished in 1814. (2) In England the lord high C., appointed after the Conquest as an officer of the Crown, had duties not dissimilar to those of the C. of France. For centuries the office was hereditary in the families of the earls of Hereford and Essex, and afterwards of the dukes of Buckingham. The office has been extinct since the attainder (q.v.) of the Duke of Buckingham in the reign of Henry VIII, although it is revived *ad hoc* on such special occasions as coronations. (3) High C.s were appointed in England from the reign of Henry VII. They were chosen at the court-leets of the hundred over which they presided. They were appointed to keep the peace in their sev. dists., but are now virtually abolished. (4) Petty or par. C.s were appointed to maintain the peace in manors, vills, and tithings when increasing pop. made the duty too onerous for high C.s alone. Par. C.s were practically abolished by the County Police Acts of

1839 and 1840, which estab. the co. constabulary, and provided that par. C.s should only be appointed by the magistrates of general or quarter sessions when deemed necessary. (5) Special C.s are sworn in by justices in cases of special emergency. The necessity for both high and petty C.s has been obviated to a great extent by the institution of (6) the modern police force, which dates from the Metropolitan Police Acts of 1831 and 1840, and, so far as bors. are concerned, the Municipal Reform Act, 1835, and the Municipal Corporations Act, 1882. See **POLICE**.

Constance (Ger. *Konstanz*), Ger. tn in the *Land* of Baden-Württemberg (q.v.), on the Rhine at its exit from the Lake of C. (qq.v.) 77 m. S. of Stuttgart. Originally a Celtic, and later a Rom., settlement, it became a bishopric in the 6th cent. In 1183 Frederick I (q.v.) made peace at C. with the Lombard tns, and in 1192 the tn was made a free city of the empire. Some of the sittings of the Council of C. (q.v.) of 1414-18 were held in the cathedral and others took place in the *Kaufhaus*, the Merchants' Hall—Jerome of Prague and John Huss (qq.v.) were condemned at this council and were burnt at the stake in 1416. The tn was occupied by the Austrians in 1548, and it was besieged by the Swedes in 1633, during the Thirty Years' War. In 1805 it became part of Baden. Its bishopric was suppressed in 1821. There is a fine Romanesque cathedral, begun in 1052; a Renaissance *Rathaus*; an old Dominican convent, now a hotel; and there are some anc. mansions. The house in which the peace of 1183 was signed still exists. In the Middle Ages C. was famous for its linen industry; it has now various textile and metal manufs., and has a large lake trade—much of it with Switzerland. Pop. 47,000.

Constance, Council of. This council was called together for the purpose of reforming the Church. The Emperor Sigismund and Pope John XXIII, with many Church dignitaries and men holding high office in the state, sat on this council, which lasted from 1414 to 1418. There were at the time 3 popes, Gregory XII and Benedict XIII sharing their power with John, and as the object of the council was to secure unity in the Church the only course open was to do away with this div. of rule, which was effected by the deposition of all three and by the election of Martin V. The general reform, however, which had been hoped for was not brought about, although it was decreed that councils were to be called periodically and that in the case of schism the final decision should lie with them.

Constance, Lake (Ger. *Bodensee*), lies between Switzerland, Germany, and Austria. It is about 45 m. long, 8 m. broad, and 1300 ft. above sea level. Area 208 sq. m. At its NW. extremity it divides into two, the N. branch being called the Überlingen Lake and the S. the Untersee. This lake has sev. tribs., the largest one being the Rhine which flows right through it, while among its smaller ones are the Argen, the Schussen, and the

Aach. L. C. sometimes rises considerably above its usual height owing to the melting snow, but it is hardly ever frozen over. There are 2 is. in the lake, Reichenau and Mainau, both belonging to Germany, and sev. tns on its banks, the chief being Bregenz, Lindau, Friedrichshafen, Überlingen, C., Romanshorn, and Rorschach. There is a regular steamboat service on the lake.

Constant I, **Flavius Julius**, Rom. emperor (337-50), youngest son of Constantine the Great and Fausta. Made Caesar in 333, he became joint emperor with his brothers, Constantine II and Constantius II, in 337, Italy, Africa, and W. Illyricum falling to his share. In 340 he defeated Constantine, who fell in battle near Aquileia, thus becoming master of the whole W. He favoured Athanasius, who was proscribed by the Arians, but C. was weak and depraved in character. He was killed while hunting in Gaul by an emissary of the usurper Magnentius.

Constant II, **Flavius Heraclius** (630-668), Byzantine emperor, elder son of Constantine III, ruled 641-68. He lost Syria, Cyprus, Rhodes, and Africa to the Saracens and Arabs, being defeated by the latter at sea, off Lycia, 655. He also fought unsuccessfully against the Slavs around the R. Danube, and lost N. Italy to the Lombards, 641. His attempts to reconquer Italy, 662, and make Rome the empire's cap. were futile. In order to end controversy between the Monothelites and the orthodox C. issued an edict forbidding all discussion of the subject. C. was probably assassinated. His son, Constantine IV (Pogonatus), succeeded him.

Constant, Jean Joseph Benjamin (1845-1902), Fr. painter and writer on art. He studied under Cabanel. Quite early he exhibited in the Salon; his 'Hamlet' was bought (1869) by the Fr. Gov. He began to paint Oriental subjects during travels in Spain and Morocco; his best E. pictures, the 'Prisoners of Morocco,' 1878, now in the Bordeaux museum, and 'The Last Rebels,' in the Luxembourg collection, are sensuous in feeling and colour. He decorated later the ceiling in the Opéra Comique and the ceiling of the Hôtel de Ville, Paris; and dramatic panels in the New Sorbonne. There is a fine series of his portraits, for which he was highly esteemed, in the Toulouse museum. He painted a portrait of Queen Victoria which was exhibited at the Royal Academy in the year of her death (1901). Among his works are 'Samson et Dalila,' 1872; 'Mohammed II,' 1876; 'Le Jour des Funérailles,' 1889; and portraits of M. Hanotaux, 1898; Pope Leo XIII, M. de Blowitz, 1902; and Queen Alexandra, 1901.

Constant, in mathematics, a quantity that never changes its value throughout an investigation or process (in contradistinction to variable quantities), often used, as in the differential calculus, to determine a series of changeable values. An absolute C. is one whose value is exactly the same under all circumstances

(e.g. any cardinal number); an arbitrary *C.* is an undetermined *C.* in a differential equation, keeping the desired value assigned to it unchanged during all changes in the value of the variables. Examples: circular *C.*, *C.* of aberration, gravitation, tidal *C.s.*, etc.

Constant de Rebecque, Henri Benjamin (1767-1830), Fr. statesman and novelist, b. Lausanne of Huguenot parents and settled in Paris at the beginning of the Revolution. The influence of Mme de Staël and Talleyrand may be traced in his *Mélanges de littérature et de politique*, 1829. *C.* was expelled from France in 1802 along



HENRI BENJAMIN CONSTANT

with Mme de Staël for denouncing the military ascendancy of Napoleon, and lived for a time at Weimar in the society of Goethe and Schiller; but he modified his views, and in 1814 returned to support the Bourbons and constitutional liberty. His chief work is *De la religion*, 1824-30, in 5 vols. (he was a rationalist in religion); he wrote also *Cours de politique constitutionnelle*, 1817-20, in 4 vols. His celebrated novel *Adolphe*, 1816, a more or less autobiographical account of his relationship with Mme de Staël, is one of the first analytical novels of modern literature. His novel *Cécile* was first discovered and ed. in 1951. See *Journal intime de B. Constant* (covering the period 1804 to 1816), 1894; *Le Cahier rouge* (autobiography from 1767 to 1787), 1907; G. Rudler, *La Jeunesse de B. Constant*, 1909; 'Adolphe' de B. Constant, 1935; C. Du Bos, *Grandeur et misère de B. Constant*, 1946; H. Nicolson, *Benjamin Constant*, 1949.

Constanta, Constantza, or Kustenji, seaport on the Black Sea, at E. end of

Trojan's Wall, is the prin. port of Rumania, and exports large quantities of grain, petroleum, and livestock. It has a fine harbour, opened in Oct. 1910. There are nearly 3 m. of quays, and a pipe-line runs to the Rumanian oil fields. The commerce of the port amounted to 2,000,000 tons in 1927. Tomi, famous as the place of Ovid's exile, was its anct name. A battle was fought between Russians and Turks at *C.* in 1854, and it was severely damaged in the First World War, being occupied by a Germano-Bulgar army in Oct. 1916. In the Second World War the Russians launched an offensive in Rumania against the Ger. and Rumanian forces on 22 Aug. 1944, and captured *C.* on 29 Aug. Pop. (1948) 79,000.

Constantia, tn in Cape Prov. lying under Table Mt.: originally an old Dutch wine farm and founded by Simon van der Stel about 1690. From this place derives the name of a famous Cape wine which enjoyed great popularity in Europe during the 18th cent.

Constantina, Sp. tn in the prov. of Sevilla. It has lead mines, and a trade in agric. produce, timber, and cork. Pop. 11,000.

Constantine II, see CONSTANS I.

Constantine III (612-41), Byzantine emperor, son of the Emperor Heraclius. He succeeded his father in 641 and *d.* in the same year. His short reign was full of disorder and constant internal strife. He is said to have been poisoned by his stepmother.

Constantine IV, Pogonatus (648-85), Byzantine emperor, son of Constans II, whom he succeeded in 668. The earlier part of his reign was occupied by a campaign in Sicily, where a usurper had been declared emperor. Immediately after he had successfully dealt with this, he was occupied in a struggle with the Arabs, who were finally forced to sue for terms. Though a capable and energetic ruler and a good soldier, he was unable to prevent the settlement of the Bulgars and the setting up of a Bulgar kingdom (679).

Constantine V, Copronymus (719-75), Byzantine emperor, son of Leo III the Iconoclast, whom he succeeded in 741. He did much to encourage trade, restore prosperity, and strengthen the empire, but is remembered especially for his religious policy. He forced the iconoclastic doctrines to be upheld throughout the empire, and so caused a break with the papacy, which from this time ceased to be dependent upon the emperors, and looked for help rather to the W. and the Franks. He also engaged in sev. campaigns against the Arabs, Avars, Slavs, and Bulgars.

Constantine VI (770-87), Byzantine emperor, Isaurian dynasty. He succeeded in 780, at the age of ten, and the empire for the next few years was ruled by Irene, the empress-mother. Eventually his mother caused *C.* to be seized and blinded and she subsequently reigned alone. His reign was disastrous, and during it the Arabs and Bulgars won many successes. It is chiefly notable for

the fact that the general council of Nicaea was held during it, 787.

Constantine VII, Flavius Porphyrogenitus (905-59), Byzantine emperor, the son of Leo VI. He succeeded his father in 912, and during the early part of his reign the empire was administered by Romanus Lecapenus, with the help of C.'s mother, Zoë. In 944 C. at last obtained real power. He wrote a number of books, and these give much information on this period. His *De Administrando Imperio* was written to aid his son Romanus in the gov. of the empire. By this same son he is said to have been poisoned.

Constantine VIII (d. 1028), Byzantine emperor, brother of and co-ruler with Basil II. From 1025 until his death C. ruled alone, devoting himself to a life of pleasure, and giving little attention to the affairs of state.

Constantine IX (d. 1055), Byzantine emperor. He was a soldier, who owed his throne to Zoë, the widow of Romanus III, whom he married. C. was emperor 1042-55. He neglected the defence of the empire, and spent huge sums in erecting magnificent buildings. During his reign Byzantine influence in Italy practically disappeared, owing to the conquest of Lombardy by the Normans, and the rift between the W. and E. Churches became complete.

Constantine X (1007-67), Byzantine emperor. He ruled from 1059 but failed to justify the hopes that had been placed in him. During his period of rule the empire was fiercely attacked by the Turks and Magyars. C. spent the greater part of his time in devotion to philosophic trifles, and neglected the military security of the empire. The last hold of the empire on Italy was lost in this reign by the capture of Bari.

Constantine XI, Palaeologus (1404-53), Byzantine emperor, son of Manuel II. When Mohammed II attacked Constantinople in 1453, C. led the final desperate resistance, having only about 9000 men in his garrison, and the help of 700 Venetians and 2 Venetian ships. When the city was carried by storm, 29 May, C. was killed in the fighting. This marked the end of the Byzantine Empire.

Constantine I (1868-1923), King of the Hellenes, b. at Athens, eldest son of King George I. In 1889 he married Sophia Dorothea, sister of the Emperor William II of Germany. For the disastrous result of the Gk campaign in Thessaly, 1897, C. as generalissimo was held responsible; nevertheless he became commander-in-chief, and so remained till 1909, when the Military League compelled his retirement, and he went to Paris. On the rise of Venizelos, 1910, C., recalled, was made inspector-general and in 1912-13 he successfully commanded the forces in Macedonia. The assassination of his father, 18 Mar. 1913, brought C. to the throne. He was successful against the Turks and Bulgarians in Macedonia and Thrace; and before the year ended his dominions were double those of his father in area. He remained neutral in

the First World War, but showed such partiality to the central powers that Venizelos resigned, Mar. 1915, coming back, however, with a large parl. majority. Eventually C. was deposed, 1917. After 3 years in Switzerland he was recalled by plebiscite, and returned, Dec. 1920. He prosecuted in Asia Minor a campaign that ended disastrously, Sept. 1922. A year later there was an insurrection in the army, and C. abdicated in favour of his son George (q.v.).

Constantine, Pope (708-15), journeyed to Constantinople to confirm decrees of the Quinisextine Council at the invitation of Justinian II.

Constantine, cap. of the dept. of C. in the E. of Algeria. The tn is picturesquely situated at an altitude of 2150 ft. above sea level, on an entirely isolated chalk rock, which is washed on 3 sides by a stream flowing through a deep ravine. C. consists of the European quarter and the old Arab quarter, which has preserved an intense local colour. The work of the native saddlers and shoemakers is famous, as also the woollen stuffs made here. It has railway communication with Bona, Philippeville, Algiers, Biskra, Tebessa, and Tunis. C.—in Rom. times called Cirta—was a city of the Massylli in Numidia, and the cap. of Syphax and of Massinissa and his successors. In the Jugurthine war Adherbal was besieged here by Jugurtha and slain in 112 BC, and the tn compelled to surrender. It was destroyed in AD 311, but was rebuilt by C. the Great in 312; was taken by the Arabs in 710, and by the Fr. in 1837. The pop. of the tn. is 148,720, of whom approx. 45,000 are Europeans; of the dept. 2,704,100 of whom 70,000 are Europeans.

Constantine the Great, see **CONSTANTINUS I.**

Constantinople, see **ISTANBUL.**

Constantinople, Councils of. Of the eight oecumenical councils convoked previous to the great schism, the first was held at Nicaea, and the second, fifth, sixth, and eighth were held at Constantinople. The first council of C. (AD 381), of 150 bishops under Pope Damasus and Emperor Theodosius I, confirmed the Nicene Creed and condemned Apollinarism—a heresy directed against the divinity of Christ. The second council of C. (553), of 165 bishops under Pope Vigilius and Emperor Justinian I condemned the Nestorian heresy. The fifteen anathematizations on Origen, sometimes ascribed to the fifth oecumenical, belong to a council held at Constantinople in 543. The third council of C. (680-1), under Pope Agatho and Emperor Constantine Pogonatus, defined a human and a divine will in Christ, thus terminating Monothellism. The fourth council of C. (869), of 102 bishops under Pope Adrian II and Emperor Basil, is only recognised as oecumenical by the Church of Rome. It condemned Photius, who had seized the see of Constantinople, but the Photian schism was successful, and no other general oecumenical council was held at Constantinople. The chief work of the C. of C. was in matters of the theology of the Incarnation, but their

decisions show a wide scope. See also COUNCILS, CHURCH.

Constantinus, Rom. serving as a common soldier in Britain in the reign of Honorius (AD 395-423). His troops proclaimed him emperor in 407, and overran most of Gaul. Honorius acknowledged him as emperor in 408, to win his support against the Goths. C. then advanced into Italy itself, hoping to depose Honorius. The rebellion of his general, Gerontius, compelled him to return to Gaul, where Honorius's general and son-in-law, Constantius, defeated both at Arles. C. was executed.

Constantinus I, Flavius Valerius Aurelius (Constantine the Great) (c. AD 288-337), b. in Moesia, son of Constantius Chlorus and Helena; first Christian emperor of Rome (306-37). After serving under both Diocletian and Galerius (q.v.) C. joined his father in Britain, and was proclaimed emperor in York by the legions on Constantius's death there (306). Galerius only granted him the title Caesar, reserving that of Augustus for his own son, Severus. In 307 C. married Maximian's daughter Fausta, but in 309 he put his father-in-law to death for plotting against him. In 312 C. marched against Maxentius, an aspirant to the Rom. Empire, who was thrice defeated in Italy and finally drowned in the Tiber while trying to escape. C. was converted about this time by the apparition of a cross in the sky with the legend *en touto nika* (by this conquer). This story is told by Eusebius, who professes to have had it from the lips of C. himself, and also, with much variation in details, by Lactantius. Being now supreme in the W., C. promoted order and prosperity among his subjects, and encouraged Christianity. In 323 he defeated Licinius, another aspirant to the Rom. Empire, once near Adrianople and again opposite Byzantium, becoming sole emperor of both E. and W. In 325 he assembled a general council at Nicaea, at which Arianism was condemned and the Nicene creed adopted. C. transferred his cap. from Rome to Byzantium about 328, naming the tn after himself Constantinople. He is said to have had himself baptised in 337, having 3 years earlier proclaimed Christianity the State religion. There is, however, much discussion as to his Christianity or Paganism. See Eusebius, *De Vita Constantini* (trans. 1845); E. Gibbon, *The Decline and Fall of the Roman Empire*, 1776-88; J. B. Bury, *History of the Later Roman Empire*, 1889; J. B. Firth, *Constantine the Great*, 1905; C. B. Coleman, *Constantine and Christianity*, 1914.

Constantius I (Chlorus, the pale), Flavius Valerius, Rom. emperor, father of Constantine the Great, b. c. AD 250. In 293 Diocletian and Maximian chose Galerius and C. to help them with the administration of the empire, each receiving the title Caesar. Gaul, Spain, and Britain were assigned to C. On the abdication of Diocletian and Maximian in May 305 C. became emperor of the W., Galerius of the E. He was a brave soldier and an able, humane, and just

ruler. He d. at Eboracum (York) during an expedition against the Picts.

Constantius II, Flavius Julius (AD 317-61), third son of Constantine the Great, who by will left his empire to his sons Constantine II, C. II, and Constans I as Augusti, with his nephews Dalmatius and Hannibalianus as Caesar and Nobilissimus respectively. On their accession, 337, C. is said to have allowed the murder of Dalmatius and Hannibalianus. Thrace, Macedonia, Greece, the Asiatic provs., and Egypt were allotted to him. He had been Caesar under Constantine I as early as 333. Throughout his reign he was at war with the Persians, and often defeated by them, notably in 348. When in 350 the revolt of Magnentius resulted in the death of Constans I, C. defeated the former at Mursa on R. Drave, 351, and in Gaul, 353, becoming master of the whole empire. In 355 C. made his cousin, the apostate Julian, Caesar and commander in Gaul. In 357 he visited Rome for the first time. He favoured the Arians, and banished the orthodox bishops. When Julian was proclaimed emperor by his troops in Gaul, C. moved west to oppose him, but d. near Tarsus in Cilicia.

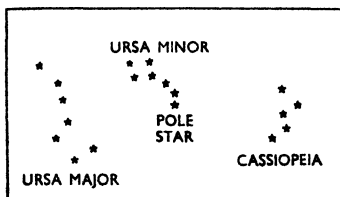
Constantius III, Rom. soldier, native of Illyria. He captured Constantine the Tyrant in AD 408, and held the rank of general by 411. He put down the rising of Attalus, 416. C. married the sister of Honorius, who made him partner of his empire, 421. For seven months C. was emperor of the W., but Theodosius II, emperor of the E., refused to acknowledge him. While preparing to make war on Theodosius C. d. at Ravenna. His son became Valentinian III.

Constantza, see CONSTANTIA.

Constanz, see CONSTANCE.

Constellation, group of fixed stars conceived generally as representing some mythological figure. The stars may be regarded as forming the framework of these imaginary figures; thus in the well-known N. C., Ursa Major (The Great Bear), a portion of which is called the Dipper, the Plough, or Charles's Wain, the rough parallelogram formed by four bright stars forms the body of the imaginary bear, whilst the three other bright stars starting in a curve from the top of the parallelogram constitute the tail. The origin of the C.s is lost in the mists of the past, but it would seem that the Chaldeans were the first to give names to groups of stars. From them this star-lore was passed on to the Greeks, and mention is made of sev. C.s by Homer and Hesiod. About 366 bc a Gk astronomer, Eudoxus of Cnidus, described a list of C.s which is substantially the same as that in use at the present day, and his work was verified by Aratus, the Gk poet who in his *Phenomena* mentions 45 C.s. Ptolemy mentioned 48 star-figures: 21 N. of the ecliptic; the 12 signs of the Zodiac (q.v.); and 15 S. of the ecliptic. Of course the ancients, not knowing of the S. terrestrial hemisphere, were equally ignorant of the S. celestial hemisphere. The S. C.s were gradually added during the 16th, 17th, and 18th cents, the chief workers in this

field being Petrus Theodori (d. 1596), Bartsohius (1624), Hevelius (1690), and Lacaille (1752). The total number of C.s is now 88, and their boundaries have been fixed. This very necessary work was done by a committee of the Brit. Association appointed in 1840, and presided over by Sir J. Herschel. The International Astronomical Union fixed the C. boundaries definitely in 1928. See under specific names; STARS; ZODIAC; also ASTRONOMY.



THREE CONSTELLATIONS OF THE NORTH

Constipation, stoppage or irregular or incomplete emptying of the bowel. The intestinal contents are propelled onwards by rhythmic muscular contractions of the bowel (see PERISTALSIS). Peristalsis is aided by physical activity and by adequate and suitable food intake. The residue which reaches the lower bowel after digestive extraction of the bowel contents is complete is known as faeces. The faeces collect in the rectum, distending it and causing a desire to defaecate. Acute C. may be due to a blockage of the lumen of the bowel, and is then a symptom of the disease causing the obstruction. Temporary C. may be due to some intercurrent general illness or a change of food habit. Chronic C. usually starts from neglect regularly to evacuate the bowel when this is indicated. This leads to overloading and overstretching of the lower bowel and, in turn, to a loss of tone or contractile strength of the musculature of the bowel wall. A vicious circle is thus set up.

Constitución, tn, cap. of C. dept, Maule prov., on the coast of Chile, situated at the mouth of the Maule R., 115 m. N.E. of Concepción. It is a railway terminus (Talca 56 m.) and a favourite seaside resort. Some ship-building is done there, and the chief products are grain and timber. A dangerous bar exists in the roadstead caused by the R. Maule washing down large quantities of sand. Pop. 7000.

Constituencies, see ELECTORATES.

Constituent Assembly, Russian, democratically elected representative assembly which met in Petrograd 18 Jan. 1918 and was dispersed by the Bolsheviks after a single session. The demand for a C. A. to estab. a democratic system in Russia had been common to all radical parties. After the abdication of Nicholas II and his brother in 1917 the Provisional Gov. (q.v.) was preparing elections to the

C. A., to which it was to surrender power. The Bolsheviks accused the gov. of delaying the elections and used this as a pretext to seize power and set up their own gov., which they at first also called 'provisional.' The elections to the C. A., based on universal, equal, and direct franchise, secret ballot, and proportional representation, were held in most constituencies on 25-27 Nov. 1917; in sev. outlying regions they were postponed, and in some 100 constituencies were not in the end held. The Bolsheviks lost the election, securing 9.8 million votes out of 41.7 million cast. Socialist Revolutionaries received 17 million, Mensheviks 1.4 million, Constitutional Democrats 2 million votes. Various non-Russian parties received a total of 7.6 million votes, of which 5 million were cast for Ukrainian parties. About 2 million went to minor parties and the rest cannot be identified. Of 707 elected deputies, 370 were Socialist Revolutionaries, 175 Bolsheviks, 40 Left Socialist Revolutionaries (pro-Bolshevik), 16 Mensheviks, 2 Popular Socialists, 17 Constitutional Democrats, 86 representatives of national parties, and one is unknown. Sev. leading Constitutional Democrat and Socialist Revolutionary deputies were arrested on arrival in Petrograd, and the Constitutional Democrat party was outlawed before the C. A. met. At its single session the elected chairman could not preserve order, and the guards—sailors headed by an anarchist—were openly hostile. When the Bolsheviks' demand that the C. A. should recognise the Soviet Gov. and all its decrees was rejected, they walked out, followed by the Left Socialist Revolutionaries. The remaining deputies hastily debated and approved an Address to the Allied Powers, a Resolution on the State Structure of Russia, and a Land Law, after which the meeting was dispersed by the guards on orders from the Bolshevik Gov. The idea of upholding the authority of the C. A. was used by the Socialist Revolutionaries in the ensuing civil war, and an ephemeral anti-Bolshevik Gov. was estab. by a committee of C. A. members in Samara in 1918. See O. H. Radkey, *The Election to the Russian Constituent Assembly of 1917* (Cambridge, Massachusetts), 1950; W. H. Chamberlin, *The Russian Revolution* (New York), 1954; L. B. Schapiro, *The Origin of the Communist Autocracy*, 1955.

Constitution, in politics, a system of law estab. by the sovereign power of a state for its guidance. Its main objects are to fix the limits and define the relations of the legislative, judicial, and executive powers of the state, both among themselves and with reference to the citizens of the state, regarded as a governed body. In the countries of continental Europe, since the foundation of the U.S.A., or at least since the first Fr. Revolution, the idea of a C. has been generally that of a written public law, promulgated by the sovereign power. In Great Britain it is the whole body of the public law, customary as well as statutory, which is continually being modified

by the general will as interpreted and expressed by the parliamentary representatives of the nation. A constitutional monarchy is one in which the sovereign is restricted in his powers by the nation's representatives; the granting of a C. accordingly means the transforming of a monarchy more or less absolute into a constitutional state. The C.s of modern Europe are political systems of establishing the gov. of a nation by the nation itself. The first historical type of a C., as expressed in Magna Charta, is a direct emanation of the feudal system. Later it was amended, enlarged, and assured by successive agreements between the nation and its sovereign, and although it has never been written, the Brit. C. stands in our days a great deal firmer and less vulnerable than the European C.s for which it has been a pattern. The Eng. C. rests on a pact; it is the normal and uninterrupted development of the principle of respect for the rights of corporations representing the nation. Other C.s, notably that of the Fr. Republic, are based on the right of the whole body of the citizens to govern themselves. These two principles differ greatly. The necessity of a C. is accentuated not only in all federated republics (most of the existing republics are federated or quasi-federated), but also in all other federated states, such as was formerly the case with the federated monarchies of Germany. In those federated states the C. has, in some way, the character of a treaty concluded between the different states combined in one federation, and thus it is quite different from any ordinary law. The pattern of the C. of a federal republic is that of the U.S.A., adopted before the outbreak of the Fr. Revolution. The other Amer. republics are wavering between the Fr. system and that of the U.S.A., but favour the former. There have been still more complicated constitutional systems, such, for example, as that of Austria-Hungary, a dual monarchy composed of two different countries practically independent of one another, but ruled by the same monarch. There may also be a confederation of sev. monarchies, as was the old Ger. confederation, broken up through the issue of the Austro-Prussian war of 1866. Absolute monarchies had no C.s, but were in certain ways ruled by traditions, such as the succession to the throne, to which every absolute ruler had to submit. These traditions, which Louis XIV and the most powerful of the Russian autocrats had to observe, were for absolute monarchies what the C. is in constitutional states. In the present cent., until the advent of totalitarianism and the era of neo-dictatorships, all modern states enjoyed more or less liberal C.s, which, however, differed very much in character from one another, but might be generally classified as (1) constitutional monarchies; (2) unitarian republic (France); and (3) federal or quasi-federal republics (U.S.A., Germany, U.S.S.R., Switzerland, Australian Commonwealth, Brazil, Mexico, etc.)—though, as is shown below, many apparent federal republics

are really unitary states. Modern constitutional monarchies in Europe, before the Second World War, were Great Britain, Belgium, Holland, Denmark, Norway, Sweden, Italy, Spain, Rumania, and Bulgaria. Most of these remained unchanged after the war, but Italy rejected the king and became a republic. Spain had ceased to be a monarchy in 1931. In Rumania the C. of 1866 (as modified in 1923), which proclaimed the state of Rumania as a constitutional monarchy, was restored by royal decree of 31 Aug. 1944; but the king was forced to abdicate in 1947 and a People's Republic was proclaimed. Before the First World War (Germany, Austria-Hungary (the dual monarchy), Serbia, and Greece were also constitutional monarchies, as were also, conditionally, Russia and what remained of Turkey in Europe. In Greece a plebiscite estab. a republic from 1924 to 1935, in which latter year the monarchy was restored. The Ger. invasion of Greece in 1941 forced the king into exile, and after the war he set up a regency pending a plebiscite on the issue of monarchy or republic, the people in 1946 choosing to retain the monarchy. France is the one avowedly unitarian republic in existence, but many other federal states are in effect unitary. In France the new C. of the Fr. Union was adopted after the war. It provides for three organs of gov. At the head is a president of the union, who presides over the Supreme Council of the union, composed of the members of the gov. and of representatives of the member states; the third organ of gov. being an assembly of the Fr. Union consisting of representatives of metropolitan France and of the member states.

Developments since the First World War. Through the world-wide upheaval of the First World War the structure of many national C.s considerably changed. The three or four prin. causes effecting these changes may be briefly enumerated: First, the further development of political democracy, a growth that had been going on before the war, but which the war intensified. The U.S.A. was to a great extent the arbiter of the settlements reached after the war and the initiator and supporter of European efforts at reconstruction and integration; consequently Amer. ideas of political democracy had a wide influence among European statesmen when they came to overhaul their constitutional machinery. The influence of the ideals of President Woodrow Wilson was immense in the years of reconstruction immediately after the fighting, and Amer. distrust of 'this king business' gave added impetus to the republican movement throughout Europe. The Ger. (Weimar) C. owed much to these ideals. Second, there was the impact of the feminist movement. Here again the war did but intensify a pre-war movement, and the aid that women rendered their countries was sufficient at its close to ensure in most European countries that women's franchise should be estab. as part of the constitutional machinery. France was the sole great European

country that made no concession to this movement. Third, the economic repercussions of the war and the post-war depression. In all the countries of the combatants, victors and vanquished alike, who should pay for the war was the paramount issue of politics, and the unrest that ensued on the attempted solutions of this problem strengthened the influence of Russia and fostered the growth of socialist parties throughout the world (much intensified after the Second World War). This, in its turn, brought about in countries like Hungary and Bavaria short-lived attempts to imitate the Russian revolution. The counter-revolutionary forces awakened by these premature attempts—forces like Fascism in Italy, the Magyar movement in Hungary (see HUNGARIAN REVOLUTION), the National Socialist and Heimwehr movements in Germany and Austria respectively—were anti-democratic and anti-feminist. Where these movements triumphed in Europe the general disposition was to abolish, or at least to suspend, the former C.s. The Fascists (see FASCISM) in Italy, under the leadership of Mussolini (q.v.), entirely re-formed the It. C., the new corporate state there no more resembling the former C. of Italy than the C. of the U.S.S.R. resembles the C. of Tsarist Russia. In Spain the directory of Primo de Rivera (q.v.) was content to suspend the C., but after his death the country became a republic, only to revert after the Civil war to a dictatorship. For Amer. C. see H. C. Hockett, *A Constitutional History of the United States*, 1939. For the C. of various countries see Dodd's *Modern Constitutions* (2 vols.), 1909, and *Select Constitutions of the World* (Irish Stationery Office, Dublin, 1922). See also E. Jenks, *The Ship of State*, 1939; W. Friedmann, *The Crisis of the National State*, 1943; K. C. Wheare, *Federal Government*, 1946.

Modern Federal and Quasi-Federal Constitutions. Recent years have seen the emergence of a strong movement for the federal form of C. as offering some hope of avoiding the anarchy of extreme nationalism (q.v.). This movement seemed to reach its climax at the time of Clarence Streit's *Union Now*, 1939, a well-reasoned plea for the association of some fifteen democratic national states in a world federation. But many of these states, such as Czechoslovakia and Austria, subsequently lost their sovereign status, and in any case this and other schemes inspired by W. ideas arbitrarily excluded partly or wholly non-European nations of great actual or potential strength such as Russia and China. Where there already existed strong common interests, common social and religious ideals, and geographical contiguity, a closer constitutional association naturally followed, as, for example, in the case of the sev. Amer. and Australian states. In these cases federation merely effectuated a common desire for closer constitutional bonds to achieve common defence and common economic interests, while leaving the constituent states as much autonomy as was consistent with

the overriding powers of the federal gov. An approach to federalism was the League of Nations with its covenant (q.v.) designed to check aggression through consultation and sanctions and an international military force. The failure of the League to check aggression made federal idealism of the kind envisaged by Briand (q.v.) in his dream of a super-European state seem too visionary. The founding of the United Nations Organisation has meant that national C.s must surrender some element of their sovereignty if U.N.O. is to prove effective.

A modern federal C. sometimes, though not always, represents a stage in a development from a loose association to a unitary state. The Ger. Confederation gave way to the federal Reich of 1870, to the more firmly knit federation of 1919, and eventually to the unitary state of Nazi Germany. The only true federal C.s existing to-day are those of the U.S.A., the commonwealth of Australia, and Switzerland. The new C. for the Soviet Union proclaimed in 1936 proposed a degree of decentralisation for the constituent republics that was not carried out in practice. The war partly explained the need to centralise power in the All-Union gov.; but it is in any event doubtful if the gov. of a socialist or other 'planned' economy can permit much real autonomy to local or regional authorities, however much they may differ socially, economically, or culturally.

The C. contemplated for India by the Government of India Act, 1935, was also quasi-federal. This Act provided for what was called a federation of India, composed of Indian states under their princes, and the provs. of Brit. India, the latter ruled by Indian ministers operating a system of responsible cabinet gov., not dissimilar from that of the Canadian provs. But, as in Canada, where the federal principle was modified by unitary elements in the form of control by the general executive over the prov. executive and legislature, so in the Indian C. the Governor-General of India was vested with powers of intervention in the affairs of the prov. govts., which modified the application of the purely federal principle; but at the same time that principle was introduced into the Act of 1935 to such an extent that it may be said to be the distinguishing characteristic of the C. contemplated by that Act (see K. C. Wheare, *Federal Government*, 1946). Part II of the Government of India Act, 1935, relating to federation, did not come into force on the attainment of Indian independence in 1947, and the Central Gov. carried on under the provisions relating to the transitional period. See also INDIA.

Totalitarian Constitutions. The distinguishing mark of the totalitarian C.s, and equally indeed of the Communist C. of the U.S.S.R., is the single-party dictatorial system of gov. based on the 'totality of the state,' as opposed to the liberal conception of the state which restricts the authority of the state to certain spheres of life, while leaving as many others as possible to the free decision

of the individual. The 'total state,' whether Fascist or Communist, extends the sphere of state influence over the whole life, private as well as public, and demands full submission of the individual to the requirements of the state. The National Socialist Germany of Hitler's day, and the Fascist Italy of Mussolini's, are the archetypes of totalitarian states. The Reichstag, elected in 1933, set aside the Weimar C. by yielding absolute power to Hitler. An Enabling Act of 1933 provided that the cabinet might make laws by ordinance, including even such laws as were not in accord with the Weimar C., which was not formally abrogated. In 1943 a decree was issued prolonging the life of the then existing Reichstag till 1947, but this body was in no sense a representative institution, nor had it any power of legislation or even debate. It met solely to effect the will of the chancellor Hitler, in whose personal dictatorship all the activities of the country, political, economic, industrial, etc., were *gleichgeschaltet* (totalitarianised). This, the working C. of Germany, provided for a leader and Reichskanzler, who was the supreme commander of the army and was also the leader in all political activities, both in the Reich and in the states. Under this quasi-C. freedom of speech and of thought and of the press was abolished, and equality before the law limited by the so-called Aryan paragraph, which arbitrarily granted full civic rights only to 'Aryans' (q.v.), while personal freedom from arrest, so familiar to Eng. political science from the passing of the Habeas Corpus Act, was curtailed by the activities of an officially recognised secret police. The constituent states of Nazi Germany were also deprived of their constitutional rights, for by the Unification Act of 7 April 1933, the federal states were all brought under the rule of governors directly responsible to Hitler; and by an Act of 1934 the sovereign rights formerly possessed by the federal states passed under the jurisdiction of the minister of the interior, and the Reich Cabinet arrogated to itself the promulgation of new constitutional laws for the federal states.

The Fascist C. introduced in Italy, which prevailed until the Second World War, represented a radical transformation of the fundamental statute of the kingdom granted on 4 Mar. 1848 by King Charles Albert to his Sardinian subjects. By that statute or charter the executive power of the state belonged exclusively to the sovereign and was exercised by him through responsible ministers; the legislative authority was vested conjointly in king and Parliament, the latter being bicameral and consisting of a Senate and deputies. But under Mussolini's Fascist regime the Chamber of Deputies was replaced by a Chamber of Fasci and Corporations (see also CORPORATIVE STATE) composed of the 150 members of the National Council of the Fascist party and of the 500 effective members of the National Council of Corporations. The duties of the Chamber were performed by the full assembly, by the budget general

commission, and by the legislative commissions. There was also a Grand Fascist Council, which was composed of the *quadrumviri* of the march to Rome as life members and various ministers and other dignitaries appointed for as long as they held their respective offices. This Grand Council existed to co-ordinate all the activity of the regime resulting from the Fascist revolution and to give its opinion on the lines of conduct of the Fascist party. Its approval had to be obtained on all questions of a constitutional nature, including those connected with the succession to the throne and the prerogatives of the Crown. In 1938 the position of the Duce or leader was incorporated in the C. of Italy. The Chamber, with the Senate, co-operated with the gov. in framing legislation. The executive power was exercised nominally by the king through the gov., but in fact by the Duce, who was only theoretically responsible to the king for the general political direction of the gov. The ministers were responsible both to the king and to the chief of the gov., i.e. to the Duce, for the actions of their respective offices. Thus, while It. Fascism served as a model to a number of similar movements in other countries, and in particular to Ger. National Socialism (q.v.), there was a somewhat higher degree of liberality in the Fascist C. of Italy than in that of Nazi Germany, where eventually Hitler placed himself above the law altogether and so made no pretence to rule constitutionally at all. For where in a Fascist or any other authoritarian state there is no real legislative body there is in effect no constitutional law; in the history of political science, absolutism has long given place to constitutional gov., and constitutional law has become supreme because only in virtue of its acceptance can the legislative body be constituted. See Sir W. R. Anson, *The Law and Custom of the Constitution*, 1886-92, 1922-35; S. G. Chrimes, *English Constitutional History*, 1948; A. V. Dicey, *The Law of the Constitution*, 9th ed. 1952; Sir Ivor Jennings, *The Queen's Parliament*, 1954; H. R. Greaves, *The British Constitution*, 3rd ed. 1955.

'Constitution of Athens,' one section of a lost work (*Politeiai*) by Aristotle on the constitutional hist. of 158 states. It was known only by quoted fragments until 1890, when three rolls of papyrus (now in the Brit. Museum) were found in Egypt, containing a MS. copy of the 'C. of A.' made about AD 100. Aristotle's authorship is not now seriously disputed, and the date is put between 328 and 325 bc. The 'C. of A.' is divided into two sections. The first gives the hist. of the constitution up to the expulsion of the Thirty (404 bc). The second describes the state officials, their appointment and functions in the writer's own day. The beginning of the MS. is missing; the last section is mutilated, but can be reconstructed almost wholly from fragments. See the eds. of F. G. Kenyon (1891) and Sir J. E. Sandys (1912). There is a trans. (together with Aristotle's *Politics*) by John Warrington in Everyman's Library.

Constitutional Club, one of the leading Conservative political clubs. It is situated in Northumberland Avenue, London, W.C., and was estab. in 1883. It has 2500 members.

Constitutional Democrats (abbr. *Cadets*), Russian political party, formed in 1905 by left-wing liberals, mostly professional people. Its most prominent leader was Milyukov (q.v.). C. D.s were the strongest single party in the first State Duma in 1906, dominating its proceedings, and they were the main opposition party in the subsequent Dumas. In 1915 the C. D.s entered and greatly influenced the Progressive Bloc in the Duma, which united all parties except reactionaries and socialists with the aim of replacing the existing gov. by one which would command the confidence of the country. Having failed to achieve this they played a prominent part in the February revolution of 1917 and in the Provisional Gov.; they withdrew from the latter in July and were outlawed by the Bolsheviks soon after they seized power. See also **DUMA**; **PROVISIONAL GOVERNMENT**.

Consubstantial (from Lat. equivalent of Gk *homo-ousios*), of one and the same substance, essential being. The word is applied in Christian theology to the Three Persons in the Holy Trinity, each of whom possesses the whole Divine Being. The general council of Nicaea (AD 325) rejected the teaching of Arius (q.v.) (that the Son is of a separate Being or nature created by the Father) and endorsed that of St Athanasius (q.v.) that He is *homo-ousios* with the Father. It was found necessary to coin this unscriptural term to define and protect the scriptural teaching concerning the Unity of God and the deity of Christ, and it was incorporated in the Nicene Creed (q.v.).

Consubstantiation, the union of two metaphysical substances; the doctrine of the Real Presence of the (metaphysical) substance of the Body and Blood of Christ together with the bread and wine in the Eucharist. The term is opposed to the Catholic 'transubstantiation,' and means strictly the transition or union of two metaphysical substances originally distinct into one common substance; substantial conjunction, or one substance out of two. The name is often applied to the Lutheran doctrine of the Real Presence, but should rightly be ascribed to John of Paris and Rupert. It is sometimes called impanation (q.v.).

Consuegra (anct *Consaburum*), Sp. tn in the prov. of Toledo. It has an anct castle and Rom. remains, and manufs. textiles. Pop. 9600.

Consuetudinary, or customary, law, as opposed to written or statute law, is that law which is derived from the customs of remote antiquity. Such is the common law of Scotland, and many of the principles of the Eng. common law (q.v.) are based upon immemorial usage, e.g. the custom of borough-Eng. (q.v.). See also **CUSTOMS**.

Consul, title of the two highest ordinary magistratos in the Rom. rep. After the expulsion of the kings in 510 BC this

office was instituted, and the first to hold it were Lucius Junius Brutus and Lucius Tarquinius Collatinus. Probably the title was at first that of praetor. The C.s were elected for one year by the *Comitia Centuriata*, and until 367 BC only patricians were eligible. The inauguration of fresh C.s was accompanied by elaborate ceremonies, including a procession to the Capitol and a sacrifice to Jupiter. The power of the C.s was considerable, but it



A CONSUL OF THE SIXTH CENTURY

was exercised jointly. They gave their name to the year, and assumed a semi-regal state. Their insignia were the *toga praetexta*, the *sella curulis*, and the twelve lictors, each carrying a bundle of rods (fasces, q.v.). To the C.s belonged the supreme command of the army, the regulation of war and peace, the judicial headship, the disposal of the treasury, and the assembling of the Senate. They could only be challenged when they again became private men at the end of their term of office. In cases of great danger, complete authority was given to a dictator, or else absolute power was temporarily voted to the C.s by the Senate. The consular power was gradually restricted. In 494 BC, when the office was still confined to the patricians, the *tribuni plebis* were appointed, with right of appeal to them from the C.s. Then in 367 BC, by the famous *Lex Licinia*, it was enacted that one C. must be a plebeian. Previous to this the appointment of censors, in 443, had removed the duties of that office from their hands, and in the same year (367) the appointment of praetors freed them from

many of their judicial functions. During the civil wars the consular office lost its original character, and it survived as the mere shadow of its old self in the W. until AD 534 and in the E. till 541.

Consul (mercantile), public officer maintained by the State in foreign countries to supervise the commercial business of the state. Early in the 12th cent. the custom grew up among the merchant city states of Italy of sending such representatives to other lands, and especially to the E. The custom extended to France, but then almost died out, to be revived in the 16th cent. Even then, not till the 19th cent. did it become universal. A C. is primarily concerned with commercial and mercantile matters, and does not rank as a diplomatic agent. He cannot therefore enter on his duties without the sanction of the gov. of the country to which he is sent. His first duty is to exhibit his commission to these authorities, and to receive their permission to enter on his duties. C.s are divided into consular agents, C.s general, C.s, and vice-C.s, and are immune from taxation unless they are themselves directly engaged in trade. The consulate is considered as part of the Brit. Empire, and so all acts officially performed by the C. are valid in our courts of law. He can perform all the acts of a notary general. It is his duty to protect the rights of his countrymen in that part; to protect them from aggression, and to secure the redress of grievances sustained by them. If he is unable to perform these duties he must report the matter to the Brit. ambas. at the cap. In addition he has to send home annually a report to the secretary of state for foreign affairs containing the returns of the trade for the different ports within his consulate, and other matters of a similar nature. Of late years it has also been his duty to send home a report of anything of importance to trade which may occur at any time, and these reports, pub. by the Board of Trade, provide valuable information to those interested in foreign trade. He holds, also, a general supervisory duty over Brit. ships and sailors.

Consulate of the Sea (*Consolato del Mare*), famous code of maritime law, supposed to be a compilation of the laws and trading customs of various It. cities (Venice, Pisa, Amalfi, Genoa) and the cities with which they traded (Marseilles, Barcelona, and others). The exact original date is not known, but the laws are thought to have been collected during the 11th, 12th, and 13th cents. The earliest known ed. was pub. at Barcelona, 1494. This was trans. into Eng. by Sir Travers Twiss, 'The Customs of the Sea,' forming an appendix to *The Black Book of the Admiralty*, 1874.

Consumption, see **PHTHISIS**.

Consumption, in economics, the use of goods or services, the enjoyment of utilities. The div. of the constituent members of a community into consumers and producers, for purposes of discussing economic questions, is misleading; for all, in a modern state, are both. State regulation of C. has, in the past, taken the form

of sumptuary laws, regulating the kind of goods, especially luxuries, such as clothes, etc., which classes of the community are allowed to adopt and use. To-day, in the post-world-war period of shortages, it takes the form of a purchase tax, the main object of which is to limit the production and C. of 'luxury' as opposed to 'utility' goods.

'Contact,' see **ARMY NEWS SERVICES**.

Contactors, powerful switches for opening or closing high-power electric circuits on load. They are usually electro-magnetically operated.

Contagion (Lat. *tangere*, to touch), the communication of disease by micro-organisms from source to host by direct contact and without any intervening transmitting agent or vector. Venereal disease (q.v.), leprosy (q.v.), and impetigo (q.v.) are examples of C. When a disease due to a micro-organism is transmitted from reservoir to host by means of an intermediary agent or vector it is called infection (q.v.). Some diseases may be communicated by either C. or infection; others are purely contagious or purely infectious. See **INFECTION** and **BACTERIA**.

Contagious Diseases of Animals Acts, see **DISEASES OF ANIMALS ACTS**.

Contango, see **STOCK EXCHANGE**.

Contarini, name of one of the twelve families who elected the first doge of Venice, AD 697. This family was one of great importance, among its noted members being sev. doges (from Domenico, 1043-73, who rebuilt St Mark's, to Alvise, 1676-84), men of letters, painters, statesmen, and soldiers (7 C. fought at Lepanto): *Andrea Contarini*, doge from 1367 to 1382; ended the war between Venice and Genoa by reconquering Chioggia.

Gasparo Contarini (1483-1542), bishop of Bologna and diplomat, was made a cardinal by Pope Paul III, 1535. He was Venetian ambas. to the Diet of Worms, 1521, accompanying Charles V on his travels, and concluding the emperor's alliance with Venice, 1523. As papal legate at the Diet of Ratisbon, 1541, he tried to effect a reconciliation between Protestants and Catholics.

Giovanni Contarini (1549-1605) was a Venetian painter of portraits and historical pictures. See J. Fontana, 'Sulla patrizia famiglia Contarini in *Il Gondoliere*, 1843.

Conte, literally a story, from Fr. *conter*, to narrate. Though not yet Anglicised this word is often used in Eng. literary criticisms. C. is strictly a generic term, covering both long and short stories, but is more generally used for a short tale dealing entirely with one set of ideas. The word is used in France as early as the 13th cent. to mean an anecdote artistically told. It is especially applied to tales of wonderful adventure and to fairy-tales. Various collections made these C.s popular in the Middle Ages, such as the *Gesta Romanorum*. It is also the title of one of the divs. of the works of La Fontaine, whose tales are identical in general character with those which diverted Europe from the days of the *fabliau* writers, through the period of

the It. *novellieri* to that of the second great group of Fr. story-tellers ranging from Antoine de la Salle to Béroalde de Verville. Like the *Contes Drôlatiques* of Balzac their subjects are light love, the cunning of wives, the deception of husbands, and the breach of vows by ecclesiastics. In his *Contes Drôlatiques* Balzac, in the fresh and wonderful language of the Merry Vioar of Meudon, has given us a marvellous picture of Fr. life and manners in the 16th cent.

'Contemporary, The' (Russian *Sovremennik*), journal founded by Pushkin in 1836. In 1847-66 it was owned and ed. by Nekrasov and during this period was the leading radical monthly in Russia; it played an important role in shaping the views of the radical intelligentsia (see INTELLIGENTSIA).

'Contemporary Review,' monthly pub. founded in London in 1866. In 1870 J. Knowles became editor, gaining as contributors, among others, Gladstone, Tennyson, Manning, Huxley, Ruskin, Froude, Bagehot, and Morley. The *Review* deals with contemporary political, theological, literary, and social questions.

Contempt of Court, term of wide import. Blackstone shortly defines it as consisting in a disobedience to the rules, orders, or process of a court, or against the king's prerogative. In this definition, however, the primary and secondary meanings are liable to be confounded. To disobey the order of a court is to flout the prerogative of the Crown as the fountain of justice (see CROWN). Hence it is that so many and diverse acts may constitute C. of C., e.g. refusing without justification to answer questions properly put by counsel, abusing the judge, assaulting an officer of the court, insulting a litigant or his counsel whether in court or in a master's office, sending libellous or scandalous letters, or offering bribes to a judge or any other officer of the court; tampering with a receiver appointed by the court to administer property, or publishing comments on cases *sub judice* (i.e. undecided), or where the hearing was *in camera*; or disregarding injunctions, decrees, orders, judgments, and so forth, where at all events it is in the power of the person so disregarding to carry out the order. C. of C. has always been regarded as a quasi-criminal matter. Hence the court has power to commit the offender to prison or impose a fine. Different courts have different degrees of power to commit. The queen's bench (q.v.) has the widest power. It can attach for contempts offered to inferior courts. But every superior court of record, e.g. any div. of the high court and the assize courts, has power to commit for every kind of contempt committed against its own authority. Other and inferior courts, like co. and quarter sessions courts, are restricted to punishing contempts committed, as it is said, *in facie curiae*, i.e. in open court. Punishment is not often severe for C. of C. In many cases, especially where the contempt is one of the court itself, an apology and payment of costs incurred by the contempt

will be deemed sufficient extenuation, provided the offender makes reparation by doing that the omission of which constituted the C. of C.

'Contemptible Little Army.' During Sept. 1914 a Brit. Expeditionary Force Routine Order was issued in which was pub. a copy of an order reputed to have been issued by the Ger. emperor, referring to the Brit. Army as 'Gen. French's contemptible little army.' This description was naturally seized upon by all who were directly interested in securing recruits and it proved to be a most effective piece of propaganda. No 'title' among veterans is more honoured than that of an 'Old Contemptible,' and an association of ex-soldiers now bears that name. In 1925 the matter was referred to the ex-Kaiser at Doorn, who denied ever having used such an expression with reference to an army, the high value of which he had always appreciated.

Contempt: 1. Term used to indicate the aggregation of attributes which constitute the meaning and are expressed in the definition of a given concept.

2. Paper signed by a ship's captain stating the ship's destination, stores shipped, etc. It has to be given to the custom house officer before the ship can clear outwards.

Conti, Nicolo de, It. traveller of the 15th cent. He acquired a knowledge of Arabic in Syria, and then started on his travels, first going to Babylonia and Bassora, then to the Malabar coast, Ceylon, Sumatra, Java, and S. China. For an account of his travels see *India in the Fifteenth Century*, 1857, which contains an Eng. trans. made by J. W. Jones for the Hakluyt Society; and also Ramusio's *Navigazioni e Viaggi* (pub. 1550, 1556, 1559).

Conti, House of, cadet branch of the house of Bourbon-Condé. Eléonore de Roye married (1551) Louis of Bourbon, the first prince of Condé, uncle of Henry IV, and brought him C. The title was renewed in favour of Armand de Bourbon (1629-66), second son of Henry II, prince of Condé, younger brother of the great Condé. His son, François Louis de Bourbon (1664-1709), a distinguished soldier, was elected King of Poland after Sobieski d. (1697), but never obtained the throne. The elder brother of François, Louis Armand (1661-85), fought in Hungary with Turenne and Prince Eugène. François Louis's grandson (1717-76) was also a candidate for the Polish throne. The family died out in 1814.

Continent (Lat. *continere*, to hold together), a word in physical geography, originally applied to a large tract of land which holds together or contains. The word is now used in contrast to the great oceans, and is applied only to the seven continents, Europe, Asia, N. America, S. America, Africa, Australia, and Antarctica. The continents make up 55,786,000 sq. m., the oceans 141,050,000 sq. m., of the surface of the earth.

Cs. are skirted by a continental shelf or terrace lying less than 600 ft below sea

level and extending up to 600 m. out from the coast. The shelf is absent or narrow where young mt. chains run near the coast of the continent as in W. America; the width of the shelf averages 45 m. Beyond the continental shelf the sea bed falls rather rapidly and forms the continental slope leading down to the very much deeper water of the ocean (average depth 12,500 ft.). See CONTINENTAL SHELF.

The continental slopes are one of the most pronounced geographical features of the crust of the earth and mark the true geological margin of the continents. The material of which continents are formed is not the same as the rock underlying the deep oceans. C.s are underlain by some 20 m. of predominantly granitic, sedimentary, or metamorphic rocks whose mean density is approximately 2.84, below which more dense material having a density of 3 or more is reached. This dense matter forms the mantle of the earth. Below the oceans the mantle approaches to within 3 m. of the sea bed. The overlying rock forming the top 3 m. of the suboceanic crust is at present regarded as basalt covered by sediments. The C.s with their very much greater thicknesses of relatively light matter may be regarded as gigantic rafts supported by the denser substance of the mantle of the earth.

Continental Congress. The C.C. of the U.S.A. was inspired by the advice and activities of the celebrated Samuel Adams in the initial stages of the resistance of the colonies to Grenville's Stamp Act of 1765. The historical importance of the meetings of the C. C. of America lies in the fact that their proceedings made manifest to the world the solidarity of the different states or provs. in their attitude towards England. The first C. C., which met at Philadelphia in 1774, was formed of delegates from all the colonies except Georgia. It was intended to be a federal body composed of states' representatives which should meet annually and whose functions were primarily to concert the best means for forcing 'the British Parliament to come to proper terms.' It had no executive powers, and indeed, like all unconstitutional or provisional assemblies (cf. CONVENTION), it had no certain *locus standi* or functions whatever. Its first act was to address a petition to George III promising loyalty in consideration of the redress of the grievances, and in the Declaration of Rights it set forth in characteristically democratic terms the collective opinion of the colonists in regard to their rights and liberties. No adequate response was met with from the Brit. Ministry, and the second Congress, which met in 1775, proceeded with greater vigour, and gave reality to the *united* or *confederated* resolutions of the delegates by raising a continental army and appointing Washington as the commander-in-chief. The third Congress met at Philadelphia in May 1776, and by passing the celebrated Declaration of Independence on 4 July severed the last tie of allegiance with Great Britain. Its position being by

now more certain, it passed laws for the colonies, and assumed all the executive functions of a provisional gov. The C. C. continued to act as the federal legislative body until 1783, when the Articles of Confederation and Perpetual Union between the states, having been ratified by most of the states, provided, though in a vague manner, for a div. of powers between the sev. states and a congress of delegates from them. See *Cambridge Modern History*, vol. vii. *passim*.

Continental Drift. The conception of C. D. was first put forward in detail by Alfred Wegener in 1910. He suggested that in early geological times all the continental masses were grouped together in a single huge continent which he named Pangaea. By degrees Pangaea was broken up by fissures and rifts and the separate fragments drifted apart until they attained their present distribution over the surface of the globe. The lines of evidence which have been adduced by Wegener and others in support of the idea of C. D.s are too complex to be summarised easily. They include the fact that certain geological structures, such as mt.-belts, appear to be abruptly cut off by the present continental margins. For example, the structures associated with the Appalachian Mts of E. N. America run out to the Atlantic shore off Newfoundland. On the other side of the Atlantic a deeply eroded mt. chain of the same age runs out to sea off the British Isles, and it has been argued that these two ranges are broken fragments of a once continuous chain which were separated by the westward drift of the Americas. Other arguments depend on the past and present distribution of animals and plants. Certain fossil species of land or fresh-water animals are found in parts of the world which are now widely separated, and the problem of how they migrated across the intervening oceans could be solved by supposing that at the time when these species first evolved the drifting of the continents had not yet opened up the space now occupied by those oceans. Several of the continents of the S. hemisphere (collectively known as Gondwanaland, .v.) show evidence of a period of Upper Palaeozoic glaciation, and the distribution of the ice sheet is not easy to explain unless we suppose that the continents were at that time much closer to each other. See A. L. Du Toit, *Our Wandering Continents*, 1937; A. Holmes, *Principles of Physical Geology*, 1944.

Continental Shelf, the term used to describe the extension of the continental land masses beneath the shallow seas bordering them. The continental shelf is made up of the same kind of material as the continents themselves. At its outer margin, where the sea's depth is of the order of a 100 fathoms, a relatively steep slope—the continental slope—leads down to the floor of the ocean basins proper, which are made up of a different association of rocks.

Continental System, method adopted by both France and England, and provoked by the Berlin Decree of 1806,

by which Great Britain was declared to be in a state of blockade, and all commerce or intercourse with her was forbidden to France and her allies. This decree, naturally, only declared a paper blockade, since the naval position of France and her allies forbade the adoption of any more stringent method. The Order in Council of 1807, issued by the Brit., naturally attempted to make reprisals. No vessel belonging to any neutral nation was to enter, or have commercial dealings with, any Fr. port or any port belonging to the allies of the Fr. In 1807 Napoleon issued the Milan Decree, which stated that any ship of any nation which had been searched by, or had paid duty to, the Brit. lost thereby its nationality and could be seized by the Fr. or the allies of the Fr. The Russian war of 1812 was a direct outcome of the refusal of the Russians to comply with the decrees of Napoleon any longer. Napoleon himself found that he was continually forced to give permission for the breaking of his own decrees, since, without Brit. goods, he himself could not get on. The scheme finally broke down, however, owing to the supremacy of Britain at sea, and her control of the markets of the world. The Eng. system, however, was an essential cause of the Amer. war of 1812.

Contingent Liability. In contra-distinction to a debt or liquidated demand, a C. L. is one that only arises at the happening of a certain event, e.g. a covenant (q.v.) by a debtor to assign after-acquired chattels to secure a debt creates a liability on the debtor to assign the chattels as soon as he acquires them. Any C. L. to which a debtor is subject at the date of a receiving order against him, or to which he may become subject before his discharge, is a provable debt, e.g. a surety has a right of proof in respect of his C. L. as surety for the debtor.

Contingent Remainder, in law, a term used for an estate in remainder upon a prior estate, limited to take effect, either to an uncertain or unascertained person or upon an uncertain event. If land is granted to A for life, and to B and his heirs at A's death, B's interest is called the remainder. A remainder given to an unborn or unascertained person, or upon some further contingency (when C shall return from abroad) is a 'contingent' as opposed to a 'vested' remainder (given to an ascertained person, and ready to go into effect upon determination of the precedent estate). Though such a remainder is an estate in expectancy (future), it is considered a present interest, and may be transferred to another party by modern legislation. See *Contingent Remainders Acts, 1845 and 1877*.

Continuation Schools, institutions where education beyond the national minimum is provided. In the 19th cent. they were schools of further training for boys and girls who had completed the course in the elementary day school. They are to be found, governed by diverse conditions, in Great Britain, Canada, Australia, U.S.A., Central Europe, and Italy. In most countries they were set up

in an attempt to help to solve the problem of half educ. children entering adult industrial life. Instruction, therefore, was to be not only vocational but also social, moral, and physical. In Germanic countries the development was very thorough. Children leaving the elementary schools went to one of sev. types of C. S. Some were part-time schools, others full-time. They received there some technical or craft training in addition to general education. Most children, in consequence, received some kind of formal education up to the age of 18. In U.S.A. the majority of C. S. came into existence after 1919, and wage earners between 14 and 17 or 18 years who had not taken a high school course had to attend a continuation school for 4 to 8 hours a week. As the proportion of Amer. boys and girls who complete the full high school course rises these regulations become less necessary. Today the school leaving age is 16 in 40 states, and 17 or 18 in the remainder. Many students then proceed to junior colleges, so that almost a quarter of the age group (18-22) are attending institutions of higher learning. In England the C. S. were first organised as a system of continued elementary schooling (not secondary) for voluntary students. Both the Fisher Act of 1918 and the Butler Act of 1944 laid down that there should be continued part-time education for all children up to the age of 18. The recommendation that day C. S. should be estab. where all young workers should be obliged to attend for a certain period each week, either to continue their general education or to be given technical instruction in subjects related to their employment, was partly embodied in the 1918 Act. Economic difficulties prevented its implementation. According to the 1944 Act, colleges were to be estab. as centres 'for providing for young persons who are not in full-time attendance at any school or other educational institution such further education, including practical and vocational training, as will enable them to develop their various aptitudes and capacities and will prepare them for the responsibilities of citizenship.' Again post war economies made it impossible to implement this part of the scheme. Nevertheless nearly 20,000 young workers are released by their employers to attend courses at day C. S. Whilst some general civic education is provided it is perhaps true to say that most of the training is technical or vocational. See Sir M. E. Sadler, *Continuation Schools in England and Elsewhere*, 1908; Edith A. Waterfall, *The Day Continuation School in England*, 1923; E. W. Knight, *Education in the United States*, 1929; R. W. Ferguson and A. Abbott, *Day Continuation Schools*, 1935; P. L. Kitchin, *From Learning to Earning: Birth and Growth of a Young People's College*, 1944; *Further Education*, Min. of Ed. pamphlet No. 8, 1947. See also *Folk High Schools*.

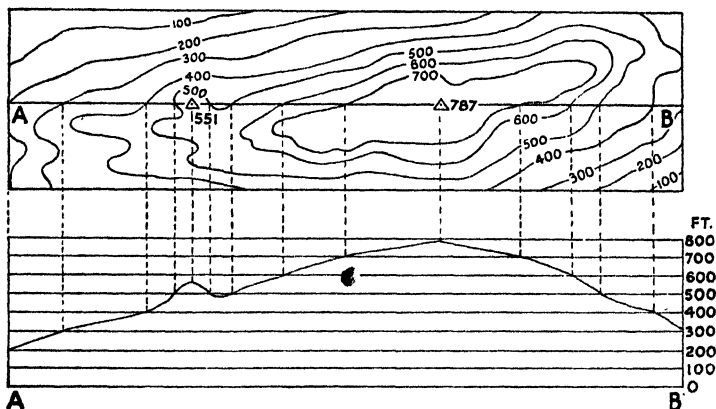
Continuity, principle by which it is assumed that appreciable changes in progressive phenomena correspond to inappreciable changes taking place at

inappreciable intervals. In psychology the principle involves the idea of a stream of consciousness; that no state or consciousness is fixed, but is arriving out of a previous state and already developing into a subsequent state. In graphical mathematics, a function is said to be continuous at a point if it is defined in an interval containing that point and has a limit at the point which is equal to the function of the point. The function is said to be continuous throughout an interval when it is continuous at every point of the interval. In hydrodynamics the principle of C. assumes that a fluid is absolutely homogeneous and devoid of viscosity; this leads to relationships

Continuous Spectrum, *see* X-RAYS, BETA PARTICLES, and SPECTRUM AND SPECTROSCOPE.

Contour, term used in physical geography, meaning an outline. C. lines are lines drawn on maps at fixed intervals, and indicate the form of the surface of the ground, each line passing through points at the same altitude above sea level. These lines will be near to each other if the slope of earth is a steep one, and are further apart where the slope is less acute.

Contraband (Fr. *contrebande*, from Lat. *contra*, against, and Low Lat. *bannum*, a proclamation), term applied to illegal traffic in general, and hence to goods



CONTOUR AND SECTION

which are only approximately true in the more practical science of hydraulics.

Continuo, in music, is the part for a keyboard instrument (organ or much more often harpsichord) used in musical performance during the whole period when compositions were based on a thorough-bass (q.v.). The word is an abbreviation of the It. term for this, *basso continuo*, and it means literally a bass part that goes on all the time, as written down by the composer, with harmony added above by the keyboard player to fit in with that of the other parts, usually indicated by figures to ensure its correctness. During the whole thorough-bass period (roughly 1600–1750) the art of C. playing was very highly developed by performers specially skilled in it, and it was to a great extent an art of improvisation, since apart from the prescribed harmony the player was free to make his part as decorative and even contrapuntal as he could. This kind of C. playing is now rare, though a renewed interest in the correct performance of old music has shown a tendency to revive it. C.s are now usually played from parts fully written out by modern editors.

smuggled into a country. More generally the term is reserved for C. of war, the name applied to certain commodities which, during time of war, it is forbidden for neutral nations to supply to either of the belligerents. C. of war includes, without any doubt, all directly military implements, such as guns, ammunition, tents, and military stores of all kinds. But unless there are special treaties between nations, which give an accurate definition of the word, much doubt is apt to arise as to the further use of the term. It is clear that articles which could only be used for peace purposes must be excluded, but there are a great number of things which, while normally so used, might give one army a distinct advantage over the other. In 1904, during the Russo-Jap. war, Russia contended that coal, flour, grain, rails, and wood and iron beams were all C. if directed to a belligerent, whether they were to be used for warlike purposes or not. Russia further claimed the right to seize any coal ship cruising in waters near the scene of war, whether or not it was destined to one of the belligerents. Great Britain and America protested against almost all of these claims, and

secured from Russia the admission that food-stuffs were only conditional, and not absolute, C.; that is to say that the destination in this case is more important than the nature of the goods. During the Napoleonic wars the Brit. Gov. insisted on the right of either belligerent to stop and examine neutral ships which were suspected of carrying C. goods. Unless it acts in contravention of the generally received customs of nations, the Admiralty court (sitting as a prize court) of each belligerent has the right of deciding what is C. of war and what is not. Various agreements exist between the U.S.A. and European countries as to the various articles to be included, and the variations between these can only be seen by reference to the actual terms of the treaties. So far as ordinary trade is concerned neutral powers may carry this on with either belligerent, except in cases of blockade. The Second Hague Conference came to no decision on the subject of C., but the matter was extensively dealt with in the conference of London (1908-9).

On the outbreak of the First World War Great Britain adopted the Declaration of London (q.v.) with certain modifications which were again varied in Oct. 1914. Under these modifications conditional contraband was made liable to capture on board vessels, even though bound for neutral ports, if the goods were consigned to order, or if the ship's papers did not indicate the consignee of the goods, or if the goods were consigned to persons in enemy ter. or in ter. occupied by the enemy. Similar tests were applied to absolute contraband by an Order in Council of 30 Mar. 1916. These, and other modifications adopted by the Allied powers, altered the Declaration of London beyond all recognition, and it was eventually abandoned in July 1916 by another Order in Council which declared that the principle of continuous voyage or ultimate destination should be applicable to both contraband and blockade. The justification for this departure lay in the fact that the relief of the civil pop. by such goods as foodstuffs might cause an increase to the military or naval forces of some other foodstuffs which the civil pop. would normally have consumed. This view, which regards modern warfare as affecting the whole of the pop. of a combatant, was held by eminent Amer. jurists early in 1914. During the First World War the distinction between absolute and conditional C. was shaken to its foundations, despite the fact that in theory the distinction was correct. But like other theories in international law it dates from a time when armies were small and comprised only a negligible fraction of the total pop. of a country. In the First World War, however, 'when every fit male in each belligerent state became a member of the military forces, when the whole country with all its resources was gradually mobilised, and the means of communication were nationalised and developed to an unforeseen degree, it was widely contended that the distinction between absolute and conditional C. was

out of date, seeing that a belligerent gov. could at any moment, and would if necessary, lay its hand on and requisition all articles in the country which were, or might be, of use for carrying on the war' (Oppenheim).

At the beginning of 1939 conditional C. was declared generally to comprise all kinds of foodstuffs, feed, forage, and clothing, and articles and materials used in their production (but the foreign ministers of the Amer. republics at Panama on 3 Oct. 1939 registered opposition to the placing on lists of C. of foodstuffs and clothing intended for civilian pops. and not destined directly or indirectly for the use of a belligerent country or its armed forces). There are two groups of articles which must always be recognised as free. Those which serve exclusively to aid the sick and wounded may never be treated as C., even if their destination is hostile. They may, however, in case of urgent military necessity, and subject to the payment of compensation, be requisitioned if they are destined to ter. belonging to or occupied by the enemy, or to his armed forces. The unratified Declaration of London laid down this rule and it was adopted in the First World War. Similarly, articles intended for the use of the vessel in which they are found or for the use of her crew and passengers during the voyage are free.

Contraband Control in the Second World War. As soon as war between the Allies and Germany broke out C. control bases were estab. by the Brit. Gov. at Kirkwall, Weymouth, The Downs (N. Foreland), Gibraltar, and Haifa. The Ger. Gov., by way of countering the effective Brit. blockade, announced that, since the Brit. C. list included goods that were not war materials, Germany would also include such goods. With regard to conditional C., Germany would follow Britain's example and take into consideration the possible destination of goods beyond the neutral port to which they were consigned. By mid Oct. 1939 the Brit. C. control had intercepted and detained nearly 350,000 tons, but the detection of C. was then becoming more difficult because the consignments were no longer openly sent to Germany, but to neutral agents. With the object of expediting the passage of neutral cargoes the Brit. Gov. decided to reintroduce the system of navicerts, as in the First World War. Under this system the navicert ensured the consignment for which it was granted an undisturbed passage to its destination. In effect the navicert was a commercial passport for goods, which was issued by Brit. Gov. representatives before they left the neutral port of shipment. Naval officers and customs officials were instructed that, subject to any delay caused by other cargo carried, such consignments as were covered by navicerts or letters of assurance should suffer as little detention as possible, unless reasons for suspicion as to their ultimate destination should arise after the goods had been shipped. By the end of Nov. 1939 the

allied C. control had detained approximately 736,000 tons of goods destined for the enemy, of which 476,000 tons had been captured by Britain and 260,000 by France. In the subsequent years of the war Ger. overseas trade was virtually swept from the seas. See J. B. Moore, *A Digest of International Law*, 1906; F. E. Bray, *British Rights at Sea under the Declaration of London*, 1911; Earl Birkenhead, *International Law*, 6th ed. 1927; L. Oppenheim, *International Law*, 1928; D. T. Jack, *Studies in Economic Warfare*, 1940.

Contraception, see BIRTH CONTROL.

Contract, an agreement enforceable at law. There must be at least two parties to a C., and they must be *ad idem* on the terms, i.e. there must be mutual assent; further, to constitute a C. there must be both the offer of a promise or a proposal, and the acceptance of that offer or proposal. C.s are divisible into (a) specialties or C.s under seal, and (b) simple or parol. Specialty C.s must be written, sealed, and delivered; in practice they are always signed, though originally the seal stood for a signature. If delivery is made subject to a condition and to a person not a party to the deed, the document is known as an *escrow*, and only takes effect on fulfilment of the condition. A deed requires no consideration (q.v.), because it is said to import a consideration. Very often a deed merely gives more formal effect to a simple C., in which case the simple C. is said to be merged in it. Parties to a deed are *estopped* from denying the truth of statements contained in it, unless fraud, duress, or mistake be proved. C.s made by corporations, with certain exceptions such as in matters of daily occurrence or the hire of servants, promises made without consideration, and leases for three years on which less than two-thirds of a rack-rent is reserved, or for any term over three years, are only enforceable if entered into by deed. Simple C.s comprise every C. written, verbal, or implied from conduct which is not a specialty. A simple C. requires a consideration (q.v.) to support it. With certain exceptions where writing is required, no particular form is essential to a simple C. Certain simple C.s must be in writing: these comprise (1) bills of exchange (including cheques) and promissory notes; (2) C.s of marine insurance; (3) assignments of copyright. As a rule transfers of shares in registered companies (q.v.) should be in writing; they are also very often made under seal. Certain other simple C.s are not enforceable unless evidenced by writing; although they may be good as a defence to an action, either by way of set-off or counterclaim. These include: (a) a promise to answer for the debt, default, or miscarriage of another, i.e. a C. of guarantee or suretyship; and (b) a C. concerning any interest in land. The requirement made by the Statute of Frauds, 1677, and section 4 of the Sale of Goods Act, 1893, that certain other classes of C. should only be enforceable if evidenced by writing, was abolished by the Law Reform (Enforcement of C.s) Act, 1954.

It is to be noted that there are certain C.s which the law will not enforce at all, and these include C.s which are absolutely void, or are voidable at the option of one of the parties. C.s tainted by fraud are voidable at the instance of the defrauded party, but, of course, may be enforced against the fraudulent party, because no one may take advantage of his own fraud. A void C. is one which has no legal validity at all, and in fact may be said to be only the semblance of a C.; for example, where A contracts to sell a thing to B under the impression that B is C. Some C.s are said to be void for illegality as being either contrary to public policy or forbidden by statute, but not all void C.s are illegal. The distinction between void and illegal C.s is important, because unless the cause of avoidance is pleaded the court will not set the C. aside, but in the case of illegality the court will refuse to enforce the C. of its own motion. Illegal C.s include, *inter alia*, those of an immoral nature, agreements for the sale of public offices, agreements to defraud the revenue, agreements contrary to the course of justice, e.g. champertous (see CHAMPERTY) agreements, agreements to commit a crime. A betting C. is not illegal; it is merely unenforceable (see GAMING). A C. in general restraint of trade is void, i.e. a man cannot validly undertake not to carry on any business at all. These C.s frequently arise where one person has learnt his profession or trade from another and is about to set up in competition. Such a person may validly restrain himself from carrying on a particular business for ever or anywhere, but a court of equity requires that the C. be reasonable in all the circumstances. Not every person has capacity (q.v.) to enter into C.s for the loan of money, or for supplying goods, other than necessities, and C.s are generally void if made with an infant.

At common law, speaking generally, all C.s with an infant other than for necessities, or in certain cases C.s deemed to be for the infant's benefit, are voidable at his option. In the case of voidable C.s, those which involved some continual obligation on the infant like partnership agreements, or C.s to pay calls as a shareholder, were, and indeed are, valid against an infant on his reaching 21, unless he expressly repudiates them; but those C.s which do not involve any continual obligation are only binding on the infant on his attaining 21 if he ratifies them. The question as to what constitutes necessities is one of fact, depending on the circumstances of each particular case. A married woman can contract in all respects as if she were a single woman, and may sue and be sued on her C. This is the effect of an Act passed in 1935 which did away with the limitation of a married woman's contractual capacity to the extent to which she owned separate estate, and also abolished the immunity from her debts of property subject to a restraint on anticipation. A C. with a lunatic is voidable only if the other party knowingly took advantage of the lunatic's state of mind. But in any case a lunatic

may ratify a C. on regaining his sanity of mind, so as to bind himself on it. A C. with a corporation, in order to bind the corporation, must generally be under the corporate seal. The exceptions are (1) in C.s relating to matters of trifling importance or daily occurrence or urgency, where they fall within the scope of the business of the corporation; (2) simple C.s made by the agents of trading corporations and relating to the objects for which the corporation was created; (3) companies registered under the Companies Act, 1948, may validly enter into C.s in writing, or by parole in cases where such C.s would be valid if entered into by private persons. C.s by an urb. dist. council of a value exceeding £50 must be under seal. In any case a corporation can enforce its C.s whether under seal or not. For the assignment of rights under a C. see CHOSE IN ACTION. The assignment of duties or liabilities under a C. is only allowable with the consent of the creditor or party to whom the duties or liabilities are owed. A breach of C. necessarily gives a right of action for damages. Where the breach goes to the root of the C. the injured party may treat the breach as a discharge of his own liability under the C. and resist any action on the C.; he may also sue or counterclaim for damages, and claim payment for any work done by him in pursuance of the C., provided the C. be severable. In some cases, generally agreements for the sale or purchase of an interest in lands, he may bring an action for specific performance (q.v.). But where the breach is partial only there is no right to rescind, unless the parties have expressly agreed that breach of a single term shall give a right to rescind, and in any case if one party shows clearly during the subsistence of a C. his intention no longer to be bound by it, that of itself gives a right to the other to consider himself exonerated from further performance. Damages for breach of C. are assessed so as to place the injured party as far as possible in his original position. The general rule is that damages should be such as may fairly and reasonably be considered as arising naturally from such breach of C., or else such as may reasonably be supposed to have been in the contemplation of both parties at the time they made the C. as the probable result of the breach of it. Damages may be given for prospective or anticipated loss as well as loss already sustained. A C. is terminated either by agreement, or by performance, or by breach tantamount to discharge of the other party, or by lapse of time. A substituted agreement so as to terminate the original C. must be supported by consideration (q.v.). Lapse of time bars the right to sue on a C., though the C. remains valid and subsisting for all other purposes (see LIMITATIONS, STATUTES OF). C.s to do impossible things are void, *ab initio*; where, too, the performance of a C. depends upon the continued existence of a given person or thing, there is always implied in the C. a condition that impossibility of performance arising from

death or the loss of the thing excuses performance where it is clear that the parties must have known, *ab initio*, that its existence was essential to the contract. Fraudulent misrepresentations, i.e. false representations of fact made with knowledge of their falsity, discharge the injured party from the C., and give a right to sue for damages (see FRAUD).

An innocent misrepresentation as to a material fact gives a right to rescind; but not a right to damages, except (a) as to misstatements in a company prospectus in reliance on which the injured party has taken shares; (b) an agent who induces another to contract with him by representing himself as vested with an authority he does not in fact possess may render himself liable to an action at the suit of such other person. Unilateral error will not, as a rule, excuse the party making the mistake from his liability under a C. A person must take the consequences of his failure to express himself according to his own intentions, if what he did say would have led any reasonable man to form the conclusions arrived at by the other party as to his meaning. But where the error was induced by the other party, the mistaken party will be entitled to rescind. A mutual mistake as to the identity of the thing about which a C. is made would render the C. null and void (see MISTAKE); and generally, where a mistake is mutual, a court of equity can annul the C., and rectify it in accordance with the true intentions of the parties. C.s induced by undue influence and duress are voidable at the option of the injured party. See G. C. Cheshire and C. H. S. Fifoot, *Law of Contract*, 1956; R. Sutton and N. P. Shannon, *Contracts*, 1956.

Contract Bridge originated in the U.S.A., where it was adopted on a large scale in place of Auction B. about the year 1927. The Portland Club Laws of C. B. were first pub. in 1929 and International Laws were agreed in 1933. C. B. differs from Auction in three important respects:

1. Only those tricks count towards game for which the declarer has contracted; surplus tricks are scored above the line.

2. A new feature named vulnerability has been introduced; the side which has won one game is liable to heavier penalties for failure in its contracts.

3. Substantial bonuses are awarded for successful slam contracts.

These innovations give an increased advantage to skilled partnerships.

In the early days of C. B. a player made the call which appeared to indicate the most suitable contract, and the more powerful his hand, the higher his bid. It soon became apparent that high bidding cramped the exchange of information between partners and led to the invention of the 'forcing bid,' a bid which compelled partner to respond however valueless his cards until a game or higher contract had been reached. The opening bid which performed this service most satisfactorily was the lowest bid of all, viz. 1 Club, and this primary 'force' became

the foundation stone of many artificial systems. The 'artificial' 1 Club was gradually ousted by the 'forcing' Two bid and by the 'artificial' 2 Clubs which achieved similar results. Conventional bidding, i.e. bids to which particular meanings are attached, is now accepted as an integral part of C. B.

Simultaneously with bidding systems were promulgated methods of card-valuation, and various writers on Contract Bridge claimed to have discovered an abacus whose employment would enable players to value their hands with accuracy. The widest publicity was given to a method named by its author, Ely Culbertson, the 'honour-trick count.' It had been known for many years that in every deal a fraction more than eight out of thirteen tricks are won by cards of honour rank. To provide a ready-reckoner Culbertson advised his readers to concentrate on exchanging information about their high cards and to ignore distributional values. He counted an ace or a King-Queen as one honour-trick, and reduced proportionately the values of other combinations of honours. Thus with the knowledge that they held 8½ honour tricks between their two hands, partners could safely contract for a slam.

Culbertson's method, to which instead of to partnership skill he attributed his many successes, has now been ousted by an even cruder system of calculation, which was devised in the days of Auction B. by Milton Work. Honour cards are given arithmetical values—4 for an ace, 3 for a King, 2 for a Queen, 1 for a Knave or two tens. By teaching that with 25 or more points between their hands partners should be in a game contract and with 33 points should bid a slam, Work provided the simplest yardstick to card-valuation ever devised. His system is erratic in making a King (3 points) the basic trick-taker, because without the support of aces or other honour cards Kings do not win the share of the 13 tricks which Work allotted to them, and aces are worth more than 4 points apiece owing to their trick-promoting power. But subsequent attempts to provide a more accurate way of reckoning values have been too complicated to have popular appeal.

The laws of C. B. originally pub. by the Portland Club were changed by agreement with the U.S.A. in 1935. Graduated penalties were abolished, and the bonuses for slams were reduced to bring them into proportion with the new under-trick penalties. The last revision of the laws became effective in 1948 and was promulgated by the Portland Club, the European Bridge League, and the National Laws Commission of America, who jointly hold the copyright. The latest code simplifies the interpretation of the laws and mitigates a number of penalties for errors in correct procedure. C. B. has greatly increased its popularity through the growth of duplicate B. In this form of C. B. competing players hold the same cards as their opponents and each deal stands by itself for scoring purposes.

There are no part-scores to influence the bidding, which is thereby greatly simplified. A bonus is awarded in each deal for game, slam, or part-score, and the presence or absence of vulnerability is fixed beforehand. An attempt was made by the Portland Club to encourage duplicate rubber B.; but the start already obtained by Duplicate B. in America and the establishment of international championships prevented the growth of duplicate rubber B., which survives in one annual tournament between London social clubs.

The future of C. B. in its present form largely depends on the restriction of artificial methods in bidding and play. The gulf between rubber and duplicate C. B. is widening, through failure of the authorities to devise a new system of scoring for C. B. which would reproduce the conditions in which rubber C. B. is played. Only those developments have acquired popularity which appeared to make the game easier, and more difficult varieties of C. B. such as C. Whist and Five-suit B. died because they placed a higher premium on skill. The only variant to survive is known as Goulash: when hands are passed out they are arranged in suits by each player and re-dealt without shuffling 5, and later 3, at a time. The result of the deal is to produce freak distributions in which one hand may consist of an entire suit, and to introduce an element of speculation into bidding which does not exist in ordinary C. B. See H. Phillips, *Complete Contract Bridge*, 1949; E. Culbertson, *Contract Bridge Complete*, 1954; G. C. H. Fox, *Sound Bidding at Contract*, 1954, and *Duplicate Bridge*, 1955; Edward Mayer, *Money Bridge*, 1955.

Contract Note, document sent by a stockbroker to his client specifying that a named amount of stock, shares, bonds, etc. has been bought at a stated price, together with the amount of brokerage charged and the stamp necessary. The Brit. stamp duties on C. N.s are on a graduated scale, from 6d. for stock or security valued at £5 and not exceeding £100, 1s. above £100 to £500, and so on to a maximum of £5 for over £20,000.

Contraction, in physiology, a phenomenon which is peculiarly characteristic of the cells constituting muscular fibre. Under certain conditions a chemical change takes place in the cell which alters its shape, diminishing its length and increasing its diameter. The result is a state of tension on the points of attachment of the cell to the adjacent tissue. In yielding to this strain the tissues give rise to movement in that part of the body. Thus the C. of the cells of the biceps flexes the forearm, while the C. of the extensor muscles tends to straighten it. C. may be tonic, when it is prolonged and equable; or rhythmic, when the C. occurs in periods alternating with periods of relaxation. Tonic C. is often caused by changes in the muscle as a part of its life without any reference to nervous stimuli. Rhythmic C. is usually in response to stimuli conveyed by the nerves from the central nervous system. It appears probable, however, that some muscles

have the power of alternately contracting and relaxing by virtue of their own constitution. Thus, warm strips of heart muscle, taken from the animal immediately after death, continue to show a rhythmic pulsation if kept warm and supplied with oxygen. If a muscle is too frequently stimulated, the accumulation of waste products causes a lessened sensibility, which constitutes muscular fatigue. *See* MUSCLE.

Contractions, *see* ABBREVIATIONS; PALAEOGRAPHY; SHORTHAND.

Contralto, term in music to denote the lowest or deepest kind of female voice, the compass extending from F or G below the middle C to F or G above the treble stave. The term is a contraction of the It. *contra* (against) *alto* (high) and means, quite literally, a lower voice set against a high one, probably in vocal duets originally. In other languages the voice is generally called by some derivative of *alto* only, but in English this is still understood to mean a masculine voice, the 'male alto' of the church choir and the glee (q.v.), and the literal meaning of 'high' is preserved in this sense, since this kind of falsetto is the highest male voice.

'Contrat Social' (Social Contract), title of Rousseau's chief work, pub. in 1762. It did a great deal to bring about the Fr. Revolution. *See* ROUSSEAU.

Contravallation, *see* COUNTERVALLOCATION.

Contreras, tn of Federal Dist., Mexico, 10 m. SSW. of Mexico City. Here, in 1847, Maj.-Gen. Winfield Scott defeated the Mexicans. This led to the victories of Churubusco (q.v.) and Molino del Rey, and the fortified hill of Chapultepec succumbed. On 17 Sept. the city of Mexico was occupied by Amer. soldiers. Pop. 7800.

Contrexéville, Fr. spa in the dept of Vosges, on the R. Vair. The waters are used for kidney, liver, and arthritic diseases. Pop. 1100.

Contributory Pensions, name applied to those pensions to which the aspirant contributes from salary or wages a certain agreed percentage during working lifetime. There are many instances of contributory pension schemes in the Brit. Empire and U.S.A., and there is a marked tendency towards an increase of them. The Brit. civil service pensions are not, however, fixed on a contributory basis, although it is generally, but not officially, recognised that the scales of emolument in the various grades have been fixed with the knowledge that in ordinary circumstances a pension follows at sixty years of age. In the teaching profession, the univs. and education authorities have, as a rule, based their pension schemes on contributory lines. Old-estab. business houses, banks, public utility companies, and insurance companies have done the same. The contribution is made by the simple process of deducting the required amount from the monthly salary payment. By far the greatest undertaking which has yet been attempted in respect of C. P. is that of the Brit. Gov. with the Widows',

Orphans', and Old Age Contributory Pensions Act, 1925. By that Act all contributors to the insurance scheme, male and female, who were between sixty-five and seventy years of age on 2 Jan. 1928, or who had attained the age of sixty-five after that date, were entitled to an old age pension of 10s. per week, irrespective of means (provided that they had been continuously insured for not less than five years). A similar pension was payable to the wife of a contributor entitled to such a pension as from the date of her husband receiving his pension, or, if she had not then attained the age of sixty-five, as from the date on which she attained that age. That Act and later amending Acts provided pensions for widows of 10s. a week, with allowances for children under fourteen years, or sixteen years if at school, at the rate of 5s. a week for the eldest child and 3s. a week for each other child. The Acts also provided for a pension of 7s. 6d. a week for the orphan children (i.e. if both parents were dead) of insured married men and widowers and of insured widows while under the ages mentioned above. The Act of 1925 and most of the subsequent Acts down to 1935 were repealed and re-enacted by the consolidating Act of 1936 on C. P. for widows, orphans, and persons between sixty-five and seventy. The rate under this Act was still 10s. a week. The Pensions (Voluntary Contributors) Act (popularly called the 'Black-coated Workers' Act), 1937, extended pension rights to some 2,000,000 independent workers—shopkeepers and professional and other persons of small means, i.e. whose total income did not exceed £400 (man) and £250 (woman), not more than half unearned. 'Initial' entrants were eligible if under 55 on 5 April 1937, at weekly contributions of 1s. 3d. for a man (or 10d. for widows' and orphans' pensions only) and 6d. for a woman. But after the beginning of 1939 only entrants under 40 were able to join the scheme, on a weekly contribution scale increasing with 'entry age,' viz. up to maxima of 2s. 11d. (man) and 11d. (woman) for age 39.

In general, all males between the ages of 16 and 65, and, following the Old Age and Widows' Pensions Act, 1940, all females aged 16 to 60 (instead of 65 as theretofore), who were employed within the meaning of the National Health Insurance Acts and did not hold certificates of exemption from health insurance, were required to insure for both health insurance and C. P., but certain classes of person could insure as voluntary contributors—such entrants after 1937 having the option to insure for either health or pensions or both, thus breaking the 'interlocked' system theretofore applicable alike to compulsory and voluntary contributors. Under the National Insurance Act, 1946, a retirement pension is payable for life to an insured person who is over pensionable age, has retired from regular employment, and has paid the prescribed number of contributions. *See also* NATIONAL INSURANCE ACT (1946).

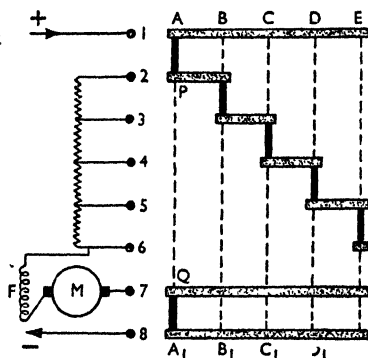
Control, Allied, was the term applied during (and for some time after) the First World War to that single control which was exerted in certain services, apart from naval and military, for the common good of the Allied peoples. At the beginning of hostilities tentative efforts, at once timid and limited, were made towards some sort of common organisation. In Aug. 1914 the Commission Internationale de Ravitaillement (C.I.R.) was estab. in London. Representatives of the buying depts of the Allies were members of this commission, which proved its usefulness from the start. It placed orders with Brit. manufacturers who turned out all kinds of war equipment—uniforms, guns, munitions, etc. It provided a certain check on exploitation and kept down prices by the elimination of unnecessary competition. In placing orders the C.I.R. had due regard to the separate needs of the different Allies. In short, this commission was a Brit. organisation set up to assist and watch over Allied purchases in the Brit. market. But the Allies' great effort in control is perhaps best represented by shipping, and the control which was eventually estab. in this service will go down to hist. as the classic example of A. C. Up to the end of 1917 each country was its own purveyor of transport. This system was, however, modified in certain respects, as Great Britain, having more national tonnage at her disposal than the other Allies, was able to allot certain tonnage to France and Italy for the conveyance of war material. By the end of 1917 the Brit. Ministry of Shipping (a war-time organisation) had performed its work so efficiently that every Brit. ship was under its control both as to its cargo and its destination. The Ger. submarine campaign caused the efforts of the Allies to be still further extended in watchfulness and effectiveness, and following a conference in Paris in Nov. 1917 the Allied Maritime Transport Council was estab. This became the supreme instrument of A. C. in shipping. For some time after the formation of the A.M.T.C. the actual shipping arrangements proceeded on the old lines, but the agreement mentioned above had already tended towards single control. The Wheat Executive was already buying and distributing on an Allied basis. The A.M.T.C. gradually assumed supreme command and performed its functions admirably to the end of the war. In the Second World War much the same objects were accomplished by setting up a Ministry of Economic Warfare as soon as the war broke out, and by the agreement made between the Brit. and Fr. Govs. to pool their resources (*see also* LEND LEASE). A Ministry of Shipping was set up a few weeks after the beginning of the war, plans for such a body to co-ordinate the activities of the merchant fleet having been made by the Board of Trade before the outbreak of the war.

The term A. C. was also applied to certain services performed by the Allies' Commission of Control in Germany and

other ex-enemy countries in the way of supervising the carrying out of those clauses of the treaty of Versailles which provided for the reduction of ex-enemy forces to a definite total of effectives, and for the limitation of their munitions output.

Controlled Establishments, term applied to Brit. industries placed under state control in time of war. At the outbreak of World War I Brit. railways and shipping were taken over by the gov. (the term C. E. was brought into use by the Munitions of War Act, 1915). Under the 1915 act all firms producing munitions became directly controlled by the gov. By the end of 1916 state control had extended into a systematic supervision of all branches of national production, and by 1918 state control for industry was complete. After the armistice, however, C. E. were gradually decontrolled. On the outbreak of World War II in 1939 a Ministry of Supply (q.v.) was estab. with purchasing powers extending to all manner of commodities, and later a Ministry of Production (q.v.) was instituted in 1942.

Controller, apparatus for starting, accelerating, braking, and reversing series motors, especially for traction. The usual drum-type C. has a vertical



shaft carrying a cast-iron drum with projections on which are mounted insulated copper strips which make contact successively with contact fingers as the drum is turned by the handle at the top. Between the fingers, resistances are inserted. The diagram shows the fingers 1, 2, 3 . . . 8, the copper strips rolled out flat, the motor M and field F. In the position shown, the motor is disconnected. Turning the drum until the line AA covers the fingers, the current flows to 1, through the connector AP, through the resistances 2-6, field, armature, 7, QA, 8. The voltage supplied to the motor is reduced by the drop across the 4 resistances, and the motor starts slowly. As the drum is turned further so that BB, CC, . . . cover the fingers, each move cuts out one of the resistances, the motor accelerating till full

voltage is supplied, when EE, is covering the fingers. This simple design may be developed to allow for reversal and braking and for series-parallel connection.

Controller of Stamps is the short title given to the officer in charge of that branch of the Board of Inland Revenue which deals with stamp duties payable on certain legal documents (e.g. leases, share transfers). The office of the C. is in Bush House, Strand, London. *See also* REGISTRAR; STAMP DUTIES.

Controller of the Navy, once an important official of the Navy Board, whose duties related to the supply of material

pyramidal shape. They were formerly thought to be molluscs, but are now regarded as scyphozoan coelenterates. Their geological age is Cambrian to Triassic.

Conurbation, a modern term for the gradual merging together or coalescence of formerly independent townships. *See also* TOWN and COUNTRY PLANNING.

Convalescent Homes are institutions carried on in connection with ordinary general and special hospitals. Their function is to provide convalescent treatment (i.e. involving at least regular medical supervision and nursing care) for



SYON HOUSE, MIDDLESEX
(a modern building erected on the site of the pre-Reformation convent)

required by the fleet. He was chairman of the Navy Board till its abolition in 1832, when his title and duties were transferred to one of the sea lords of the Admiralty. Before the First World War the Third Sea Lord was C. of the N.; but in 1912 the C.'s dept was reorganised, its work distributed amongst other depts, and the title dropped. The C.'s dept has never been revived, and its work is still distributed in accordance with the reorganisation of 1912. But when, with increase of Admiralty business during the war, Sir Eric Geddes joined the Board of Admiralty (1917), he was given the title of C. Sir Alan Anderson succeeded him as C. when Sir Eric Geddes became First Lord; but in 1918 Sir Robert Horne joined the Board of Admiralty in succession to Sir Alan Anderson and took the title of Third Civil Lord; whereupon the title of C. was once more assumed by the Third Sea Lord and is still borne by him. *See also* ADMIRALTY.

Conularids, extinct marine animals with a chitinous shell generally of elongated

patients discharged from hospital but requiring a period of rest and recuperation after illness or operation. In cases where medical supervision and nursing care are not required, facilities for rest and recuperation are provided by what are generally referred to as recuperative holiday homes.

Convallaria, *see* LILY OF THE VALLEY.

Convenae, *see* COMMINGES.

Convent, assembly of persons gathered together in retirement from the world, and also the house in which such a community dwells. In this wider sense it denotes either a monastery or a nunnery, or the fraternity or sisterhood of an abbey or priory; but the word as used to-day means a Christian nunnery where devout women spend their lives in prayer and works of charity and education. Most of the Eng. nunneries before the dissolution of the 16th cent. belonged to the Benedictine order. The most important of these were Shaftesbury (Dorsetshire), which, traditionally, was founded by Alfred, and became extremely wealthy;

Barking (Essex), founded by Erkenwald, bishop of London, in the 7th cent., Ethelburga being its first abbess; **Amesbury (Wiltshire)**, founded in Saxon times, and refounded by John in 1199; **St Mary, Winchester; Malling (Kent); Markyate (Bedfordshire); Catesby (Northamptonshire); Clerkenwell**, founded in the 12th cent.; **St Helen's (London)**, founded in the 13th cent.; **Stratford-at-Bow; Chatteris (Cambridgeshire); Polesworth (Warwickshire)**. The Cistercian nunneries were smaller. The chief of these were **Tarrant (Dorsetshire)** and **Swine (Yorkshire)**. The Augustinians and Dominicans disputed the ownership of the large nunnery at **Dartford**, founded in 1355. **Syon (Middlesex)**, founded in 1414, was among the wealthiest religious houses in England; it was held by the **Brigitine** (see **BRIGIT, ST**) branch of the Augustinians. The **Poor Clares** (see **CLARE, ST**), or female Franciscans, held sev. houses, the largest being in London, near Aldgate, founded by **Blanche of Navarre**, wife of **Edmund of Lancaster**, at the close of the 13th cent. See also **ABBEY; MONASTERY; PRIORY**.

Conventicle, term originally applied to a meeting of the monks in a monastery, but acquiring a special use at and after the Reformation as applied in a disparaging sense to meetings of Eng. and Scottish Nonconformists, such as the Covenanters.

Convention, term applied by Eng. constitutional lawyers to an extraordinary meeting of the Houses of Parliament at a time of national crisis in contradistinction to a meeting in session initiated by the writ of the sovereign. Instances of such C.s in Eng. hist. are the Parliament summoned by **Gen. Monk** to restore **Charles II** to the throne in 1660, and that summoned by the **Prince of Orange** in 1689 before he was made King of England. In **Fr. hist.**, the body which took the place of the national legislative assembly in 1792, proclaimed a rep., and in the course of its 3 years' duration passed a number of revolutionary measures, was called the **National C.** In military matters, a **C.** denotes a treaty made between the commanders of 2 opposing armies concerning the terms on which a temporary halt in the fighting shall take place. The last **C.** of this nature in which Great Britain has been concerned was the much-abused **C. of Cintra** made in 1808. In **U.S.A. hist.** the most celebrated **C.** was that presided over by **Washington**, which met at **Philadelphia** in 1787. Twelve of the 13 states (Rhode Is. excepted) sent delegates, among whom were such men as **Madison, Sherman, Randolph, the Pincknoys, James Wilson, and Morris**. The great work was the making of the **U.S.A. constitution**. In **U.S.A. politics** the term also applies to meetings of party supporters preceding a presidential election to nominate electors. See **ELECTIONS**.

Convention Treaties are treaties entered into between different states under which they each bind themselves to observe certain stipulations contained in the treaties. In 1843 two Acts were passed giving effect to conventions between

Queen Victoria and the **King of the Fr.** and the **U.S.A.** for the apprehension of certain offenders. The Act relating to France legalised a convention providing for the surrender of persons accused of murder, forgery, or fraudulent bankruptcy who may escape to France. The Act relating to the **U.S.A.** was similar in its nature, but the specified crimes included in addition piracy, arson, and robbery, but not fraudulent bankruptcy. See **EXTRA-DITION**.

Convergence, in mathematics, *see* **SERIES**.

Converse, in logic, the proposition which is obtained by turning the subject of another proposition into the predicate, and the predicate into the subject. Only universal negative and particular affirmative propositions can be so treated. For instance, if we assert that no birds are quadrupeds, it must be equally true that no quadrupeds are birds; again, if it be asserted that some Englishmen are scientists, it must be true that some scientists, at least, are Englishmen. On the other hand, universal affirmative and particular negative propositions cannot be simply converted. If we assert that all men are mortals, it by no means follows that all mortals are men; and from the assertion some men are not Englishmen, it cannot be concluded that some Englishmen are not men. The general rule is that nothing can be concluded about the individuals of a class unless the first assertion includes all the individuals. Valid conversion is therefore simply stating the same fact in a different order of words. In **Euclid's geometry** the propositions are of the universal affirmative type, so that a **C.** obtained by interchanging subject and predicate is not necessarily valid, and therefore requires a separate demonstration.

Conversion: 1. In law: (a) a wrongful act depriving another of his property permanently or for an indefinite time. The restriction to the literal or natural meaning of converting property to one's own use has long been discarded in favour of the wider notion of any unauthorised assumption of the powers of the true owner. (b) In equity, conformably to the maxim that equity considers as done that which ought to be done, the effect of words in a deed or will directing money to be expended in the purchase of land, or land to be sold and turned into money, is that the money and land are considered for all legal purposes to be actually converted into land and money respectively.

2. In logic, *see* **CONVERSE**.

3. In theology: (a) divinely produced spiritual change of heart, or a turning of the heart towards God with heartfelt repentance leading to a general reformation of conduct. (b) Proselytism, or the act of winning new adherents to a religious faith, or of being won over to it.

Converter, iron retort used in the **Bessemer process** (q.v.) of making steel, and for obtaining metal from matter (metal sulphides). It consists of blowing air through molten iron or molten matter.

An air-blast of 15 lb. per sq. in. is introduced through one of the hollow trunnions on which it is mounted, the C. being first brought to red heat by being filled with burning coke.

Converter, Rotary, a machine usually employed for converting alternating into direct current. The coils of the armature are connected on one side to slip rings, on the other side to the segments of a commutator. The d.c. field is separately excited and the machine is run as a synchronous motor, the slip ring brushes being supplied from a.c. mains, while direct current is obtained from the commutator brushes. See ELECTRIC MACHINES.

Conveyance, in law, denotes the deed by which are transferred various kinds of property as defined by the Conveyancing Act, 1881. Property for the purposes of a C. includes real and personal property, any interest in such property, any debt, chose in action (q.v.), or any other right or interest. The term C. also includes an appointment (i.e. the exercise of the right or power given by an earlier instrument to appoint any person as owner of property), a covenant (q.v.) to surrender copyholds, and a vesting declaration made on the appointment of a new trustee by virtue of which the ownership of property is transferred to the new trustee for the purposes of the trust. Cs which simply transfer personal property are called assignments. Cs by matter of record include private Acts of Parliament and grants by the Crown. The formal parts of an ordinary deed of C. of lands, which in these days have been fortunately shorn of much of their former remarkable verbiage, are: (1) the date and names of the parties; (2) recitals of relevant facts, such as the preliminary agreement and the vendor's title; (3) the *testatum* containing the operative words, or words which direct attention to the object intended to be effected by the C.; (4) the recital of the consideration (q.v.), and receipt thereof; (5) the *habendum* showing the extent of the interest taken by the grantee; (6) reciprocal covenants (q.v.); (7) the signatures and seals of the parties.

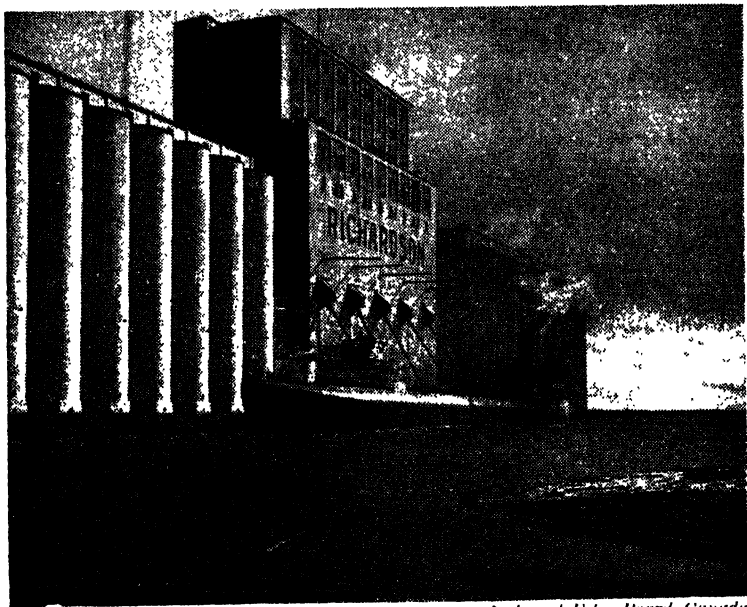
Conveyancing, art of preparing conveyances (q.v.) of real and personal property, of investigating the title of the vendors of property, of making wills and testaments, settlements (see also ENTAIL) of property, and of framing the various instruments which are necessary in passing property from one person to another, so as to effectuate the intentions of the parties. By the old common law freehold lands were conveyed by *feoffment* (or gift of a *fief*) completed by delivery of possession. A number of statutes, notably the Conveyancing Act of 1881 and the Land Transfer Act of 1875, materially simplified the extraordinary intricacy of the forms or precedents once used in C. Under the Land Transfer Act, 1875, real property may be conveyed by a short form presented by rules, the transfer being entered in an official register, and a land certificate being

delivered to the transferee after the title has been officially examined. By the combined operation of the Land Transfer Acts, 1875 and 1897, and the Order in Council made under those Acts, registration of title to lands in the co. and city of London was made compulsory on sale, though the conveyance, as distinct from the registration, might, if the parties elected, still be effected by themselves or their legal agents.

The tendency of land law reform in Great Britain for many years past has been to approximate the law of realty to the law of personality. The Law of Property Act, 1922, together with some six consolidating statutes, was designed to rid Eng. land laws of the remnants of formalism and feudalism, and to introduce a revised and simplified system of deducing title. The scheme of these Acts was experimental or tentative, the object being to make a trial of the revised system of C. without registration over a period of 10 years from 1 Jan. 1926, and, at the same time, if it proved successful, to provide machinery whereby registration might be made compulsory without the necessity of obtaining the consent of the co. council of the area to which compulsory registration was to be applied (Land Registration Act, 1925). It is open to any co. council or council of a co. bor. to apply to the Privy Council for an order making registration of title compulsory in its area. There have been many Land Transfer Acts, beginning with that of 1862, many of them nugatory; and their purport was to make an interest in land transferable by conveyance by mere entry on a public register, as shares are by entry on the books of a company. The Act of 1897 ordained that transfer in this way should be imperative; but this compulsory transfer by registration was suspended from immediate operation except to a limited extent. The Land Registration Act, 1925, repealed the Land Transfer Act, 1875, and the whole of the Land Transfer Act, 1897, except Part I, which was in turn repealed by the Administration of Estates Act, 1925. Under the Land Registration Act, 1925, an Order in Council may be made extending the area of compulsory registration without any resolution of any co. council and in the face of any resolution of any co. council to the contrary, but subject to compliance with certain conditions (see further REGISTRATION OF TITLE). Since the Act of 1925 estates capable of subsisting as legal estates (i.e. as opposed to equitable estates) are the only interest in land in respect of which a proprietor can be registered, and all other interests except overriding interests (incumbrances, easements, etc.) and interests entered on the register before 1926 take effect as minor interests; but all interests (except undivided shares of land as to which there can now be no legal estate) entered on the register before 1926 which are not legal estates are capable of being dealt with under the Act. See also VENDORS and PURCHASERS. See J. F. R. Burnett, *The Elements of Conveyancing*, 8th ed. 1952.

Conveyors and Elevators. C. are mechanical appliances for transporting material in bulk horizontally. E. are for lifting materials, but either may perform the double office in some degree. C. and E. are used for loading or unloading ships, for transfer or lifting of material in mills, in gas-works, etc. The docks of the Port of London Authority receive about 2,000,000 tons of grain p.a., with plant capable of dealing with 2260 tons/hr if working at full capacity. Manchester has a grain

off at any point for the purpose of filling bins in turn, the arrangement shown by the diagram is used. This consists of a carriage supporting drums so placed as to throw the material into the shoot at A, and by moving the carriage along the point of discharge may be varied at will. The drums, being mounted to swivel round the point B, may be taken out of use if required. A band conveyor may discharge at a terminal drum into a stationary shoot. At low speed the



National Film Board, Canada

THE RICHARDSON GRAIN ELEVATORS AT PORT ARTHUR, LAKE SUPERIOR
The whaleback S.S. *John Ericsson* taking on a cargo of wheat.

elevator able to lift 350 tons/hr, with facilities for dealing with large quantities of cotton, while Swansea has plant at its docks capable of shipping 12,600 tons of coal per hr.

C. are chiefly used for the transfer of material to bins or hoppers, to breakers, or from breakers to furnaces or retorts, as in iron- or gas-works, and for the transport of refuse, as coke or clinker. They are also used for carrying bales, sacks, etc. *Band C.* are formed of bands of leather, or canvas and rubber, supported at intervals of about 6 ft upon rollers, actuated at one end by a driving drum. This type was first used for transport of grain in 1868 at Liverpool. The linear velocity of the band may be from 150 to 200 ft per min. for large coal and heavy material, up to 700 ft for grain. If it is desired to take

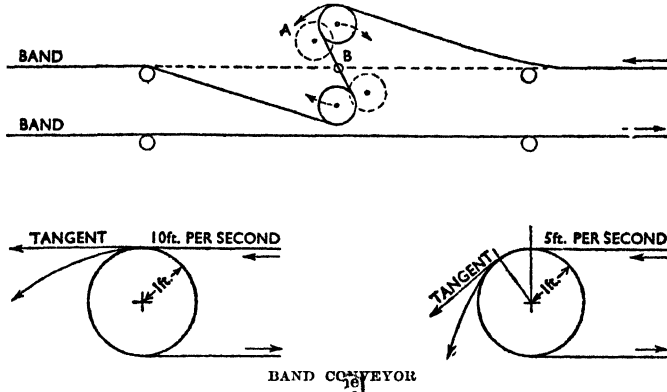
material carried may remain on the band as it passes round the throw-off drum, while on the other hand at high speed the material may leave the band on reaching the top of the drum. This depends upon the joint effect of gravity and the centrifugal force; the point at which these are equal will be the point where the material will leave the band. Flocculent material may be checked by air resistance in some degree. The diagram given shows results for velocities of 10 and 5 ft per sec., with a drum of 2 ft diameter. The travelling band is commonly fed from a hopper, and as rough and hard material is liable to cause injury, it is essential that the material should be fed on in the direction of motion, and preferably at the band's velocity. The band is commonly kept at a suitable tension to grip the driving drum

by a loose weighted pulley, steadied by guides, which takes up any stretch of the band, which ought not to exceed one twenty-fifth of its length. Band C., though commonly horizontal, may be inclined to as much as 1 in 2 $\frac{1}{2}$.

Tray C. are formed of a series of trays connected to form a continuous chain. The material is carried forward upon the trays, which discharge either at the end or

tipping the buckets automatically. They run at about 40 ft per min.

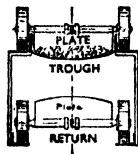
E., commonly used with C., are generally of the bucket type, in which buckets are spaced upon chains passing over drums at the top and bottom. The whole is mounted in a cage, having guides for the support and control of the moving parts. The elevator buckets dip into and scoop up the material to be raised at the



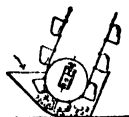
BAND CONVEYOR

at any point desired, by a tipping device. Push C. consist of a trough within which the material lies, being pushed along by a series of push-plates attached to a chain running at 120 ft per min. Discharge at any point but the end is effected by slides in the bottom of the trough, any one of which being drawn allows all or a part of the material to fall through. Push C., when used to transport hot coke, are of the simplest construction, without rollers, the trough being formed with stopped or rising ends, to retain water used for quenching purposes. Cable C. consist of disks strung upon a running cable working in a continuous trough, and are

bottom, and discharge at the top into shoots. For velocities of 250-350 ft per min., and clean material, the elevator may be vertical, in which case there will be an effective throw-off into the shoot, but for such material as coal, ore, or coke, for which speeds of from 50 to 160 ft per min. are desirable, the elevator should be sloped at 45-75 degrees with the horizon.



PUSH-PLATE CONVEYOR



BUCKET ELEVATOR

generally used for loose and light materials, being run at low speed, not much exceeding 100 ft per min. Bucket C., in which hanging buckets are spaced along a driving chain, being supported by guides, are chiefly used for horizontal movement for some distance, with vertical movement at a given point, and are useful for lifting material above hoppers and finally distributing it to the receptacles by

Pneumatic E., in which air under pressure or with suction is used, are applied for the raising and transfer of grain. London has E. of this description able to deal with 1000 tons/hr, in addition to bucket E. Though convenient and readily adaptable to picking up at various parts of a ship's hold, the pneumatic method is not economical of power. An old form of elevator, known as the Archimedeian

screw, now but little used, raises material by the rotation of a worm, or of a helically formed surface, working in a cylindrical tube. By the screw's rotation the material is carried up the sloping case and discharged at the top. The pitch of the screw influences the inclination at which the casing may slope. The angle which this makes with the vertical should be somewhat greater than the angle of pitch, plus the angle of repose of the material. The same device working horizontally is sometimes used as a conveyor. The power required to work C. and E. is generally provided by electro-motors. In inclined coal E. the power absorbed may be as much as four times that corresponding to the work of lifting the material, and in grain E. about two and a half times. For C. dealing with 50 tons per hr. the h.p. absorbed may be taken approximately as:

Band C., grain	$2 + \frac{L}{35}$
" " minerals	$2 + \frac{L}{30}$
Push-plate C. (with rollers)	$2.5 + \frac{L}{25}$
" " " (without rollers)	$2.5 + \frac{L}{15}$
Tipping tray C.	$2.5 + \frac{L}{8}$
Screw C.	$3.0 + \frac{L}{8}$

L being the length of conveyor in ft. A variety of elevator for loading ships, known as *coal hoists*, receives the wagons from rails (which may be above the quay level) and, either raising or lowering them to a given height, discharges the wagons by bodily tipping the contents down a shoot into the vessel's hold. They are commonly worked hydraulically, the act of tipping being effected by an oscillating ram. Hoists of this description are capable of dealing with wagons of 30 tons gross weight, and are made to work up to 700 tons per hr. They are also arranged to receive wagons at the quay level, and after lifting and discharge to deliver them at a high-level railway viaduct along which they gravitate to siding level, an arrangement favourable to speedy working. Steel belt C. employ a steel band instead of the usual canvas or rubber belt. They are far superior to the other type, and much heavier loads can be supported upon them. The belt consists of finely tempered steel sheets about 300 ft long, 1-2 ft wide, and 1 mm. thick, riveted together to form a continuous band. The belt is not so flexible as the canvas or rubber conveyor, thus the sag due to its own weight is less, and consequently fewer rollers are required to support it. If boards are placed alongside it the amount carried on it can be increased enormously. Another great advantage is that it can convey materials at higher temps. than can the rubber conveyor,

substances heated up to 200° F. not affecting the belt unduly.

During recent years the use of continuous-belt C. in factories has been generally adopted, the articles which are assembled being passed down a long line of workers seated on either side; when the conveyor reaches the end the finished article is taken off. This has enabled the rate of production to be increased enormously. See ESCALATORS; LIFT.

Convocation (Lat. *convocatio*, a calling together), term usually restricted to assemblies of the graduates of certain univs. or of the clergy. In England the name is particularly given to an assembly which is called together by the archbishops of Canterbury and York, each within his own eccles. prov., pursuant to a royal writ. A C. is summoned whenever Parliament is about to sit, and is continued as long as Parliament continues. The assemblies consist of two houses, the Upper and the Lower. The Upper House consists of the bishops and their archbishops; the Lower consists of the deans and archdeacons of every cathedral, the provost of Eton (in the case of Canterbury), proctors sent by the cathedral chapters, and proctors elected by the clergy of the diocese. The origin of C. is unknown, but by the time of Edward I it had reached its fully developed form, the writ issued by the monarch to the metropolitans then being identical in form with that now issued. From this time till 1664 the clergy reserved the right of taxing themselves, and one of the chief duties of C. was the voting of subsidies to the Crown. The independence of C. was marked until the reign of Henry VIII. when that monarch secured the doubtful admission from C. that it 'is, always has been, and ought to be summoned by authority of royal writ.' Owing to a lack of submission shown by the Lower House in 1717, C. was prorogued, and, except on unimportant occasions, its powers remained in abeyance until 1852. It then resumed its sitting, and its activity is steadily increasing. C. is concerned primarily with doctrinal and spiritual matters, whereas the Church Assembly (q.v.) is a legislative and administrative body. See A. F. Smethurst, *Convocation of Canterbury*.

Convolvulus, typical genus of the family Convolvulaceae, consists of about 180 herbaceous and shrubby plants growing in temperate and sub-tropical climates. Many of these are twining plants with large, white, trumpet-shaped flowers, and contain a milky latex. *C. arvensis* is the common bindweed found in Britain; it grows in a sandy soil, and the flowers have a sweet fragrance. *C. scammonia*, a native of the Levant, has a rhizome which yields a resinous juice, from which the purgative drug known as scammony is obtained. In the U.S.A. the plants are known as morning glory.

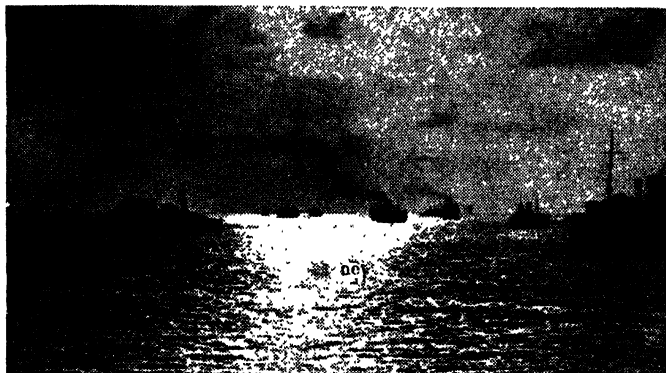
Convoy (Late Lat. *convicare*, to accompany), in the navy, the name given to one or more ships of war sent to protect a merchant fleet from the attacks of a

national enemy or from pirates. In military service the C. is strictly a train of wagons stocked with provisions or supplies for war. The term is also used for a detachment of troops or escort appointed to protect such a train or sometimes people.

Towards the end of the First World War, owing to Germany's unrestricted submarine campaign, practically all ocean-going vessels voyaged to or from Great Britain in C.s, and such C.s included neutral vessels. Very soon after the outbreak of war in 1939 the C. system was in full operation again, and by the beginning of Dec. 1939 Churchill, first lord of the Admiralty, was able to announce that less than 1 ship in 750 had

in infants more readily than in adults, the infant cerebral tissue being more subject to minor causes of dysfunction. Thus teething and digestive upsets may cause C. in babies. Nevertheless medical advice should be sought. First-aid treatment of C. consists in preventing the patient from injuring himself and maintaining a clear airway by removing false teeth and preventing the tongue from falling back.

Conway, William Augustus (1789-1828), actor, b. London. His most famous parts were Shakespearian, including Othello, Henry V, and Mark Antony, and he created the part of Prince Zerbino in *The Noble Outlaw*, 1815. He had a romantic friendship with Mrs Piozzi, ending his



Imperial War Museum: Crown Copyright

A BRITISH CONVOY AND ESCORT, 1942

been sunk in C., although subsequently losses were considerably higher. The C. system, however, was undoubtedly responsible for saving hundreds of thousands of tons of merchant shipping that, sailing without armed protection, would have been an easy prey to U-boats. See also ATLANTIC, BATTLE OF; NAVAL OPERATIONS IN THE SECOND WORLD WAR.

Convulsionaries, see JANSENISM.

Convulsions, involuntary contractions of an extensive group of muscles due to cerebral disturbance. See also under EPILEPSY. The disturbance of cerebral function may be due to local damage of brain tissue as in apoplexy (q.v.); or brain tumour, or brain injury as in fractured skull and concussion; or inflammation as in meningitis (q.v.) or encephalitis (q.v.) or brain abscess; or to some chemical or organic toxin circulating in the blood. Thus strychnine poisoning may cause C. and so also may uraemia (q.v.). There is usually loss of consciousness during a true convulsion, together with loss of control over the bladder, so that water is passed involuntarily. In a hysterical convulsion loss of consciousness and loss of control do not occur. C. occur

picturesque career by committing suicide by drowning off Charleston, U.S.A.

Conway, Conwy, or Aberconwy, seaport, mkt tn, and municipal bor. of Caernarvonshire, N. Wales, on a steep slope at the estuary of the R. Conway, 12½ m. from Bangor, 22 m. from Caernarvon. It is one of the most striking old tns in Britain. It is surrounded by strong walls with battlements and towers. C. castle, one of the grandest feudal fortresses of Britain, was built by Edward I (1284) to check the Welsh. It has very thick walls and 8 vast towers. The Cistercian abbey (1185) was removed by Edward I to Maenan, near Llanwrst. Its ruins are still to be seen, and the anct church at C. is said to be substantially the abbey church; it has a magnificent 15th cent. rood screen. Plas Mawr, an old Elizabethan mansion, is now the home of the Royal Cambrian Academy. The castle was held for Charles I during the Civil war. The remains of the Rom. fort of Conovium are 4½ m. from C. The site was excavated in 1926-7, showing that it was probably built about AD 112. Pop. 11,250. (See illustration, p. 760.)

Conway of Allington, William Martin Conway, 1st Baron (1856-1937), traveller,

mountaineer, and writer, from 1901 to 1904 Slade prof. of fine arts at Cambridge. Travelled in the E., the Himalaya, the Alps, Spitzbergen, and also the Bolivian Andes, when he ascended Sorata, Illimani, and Aconcagua, and explored the glaciers of Tierra del Fuego. M.P. (Unionist) for Combined Eng. Univs., 1918-31. His works include *Climbing and Exploration in the Karakoram-Himalayas*, 1894; *The Alps from End to End*, 1895; *The First Crossing of Spitzbergen*, 1897; *The Bolivian Andes*, 1901; *Aconcagua and Tierra del*

Lecturer in 1839 and instituted dean of Llandaff in 1845.

Conya, see INULA.

Cooch Behar, former princely state now merged in W. Bengal state, India, lying on the route from Sikkim and Darjeeling into Assam.

Cook, Eliza (1818-89), Eng. poetess, b. Southwark. She spent most of her life in London. She contributed to numerous periodicals, notably the *Weekly Dispatch*, and ed. *Eliza Cook's Journal* from 1849 to 1854. In 1863, her health having given



E. Emrys Jones

CONWAY HARBOUR

Fuego, 1902; *The Alps*, 1904; *No Man's Land*, 1906; *The Sport of Collecting*, 1914; *The Crowd in Peace and War*, 1915; *The Abbey of St Denis*, 1916; *Mountain Memories*, 1920; *The Van Eycks and their Followers*, 1921; *Palestine and Morocco*, 1923; *Art Treasures of Soviet Russia*, 1925; *Giorgione as a Landscape Painter*, 1929; *Episodes in a Varied Life*, 1932; *A Pilgrim's Quest for the Divine*, 1936.

Cony, see CONEY.

Conybeare, William Daniel (1787-1857), geologist and divine, b. London, grandson of John C. (1692-1755), dean of Christ Church, Oxford, and bishop of Bristol. Educ. at Westminster School and Christ Church, Oxford. Fellow of the Geological Society, 1811, F.R.S. First to describe Ichthyosaurus. Many geological pubs. He is, however, chiefly remembered for his *Outlines of the Geology of England and Wales*, written in collaboration with W. Phillips, 1822. Appointed Bampton

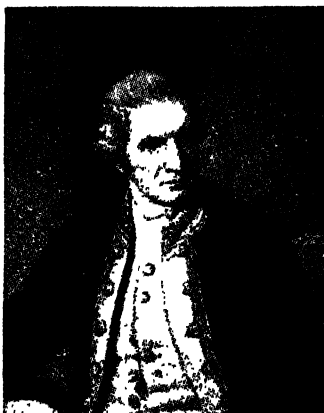
way, she received a civil list pension of £100. Sev. of her lyrics, such as 'The Rover's Song' and 'The Old Arm-Chair,' were very popular. Her works included 4 vols. of verse (1835-45); *Jottings from my Journal*, 1860; and *New Echoes and other Poems*, 1864.

Cook, Frederick Augustus (1865-1940), Amer. explorer, b. Callicoon Depot, New York, son of a Ger. immigrant who changed his name. Drove a milk wagon to pay his college expenses; graduated in medicine at New York Univ. Surgeon to Peary Arctic Expedition, 1891-2; led two expeditions along the W. coast of Greenland, which were failures; ship's doctor on Belgian Antarctic expedition, 1897-9. In 1903-6 led expedition to ascend Mt McKinley, Alaska, and claimed to have reached the summit, but other explorers openly doubted his claim. In 1909 he startled the world by his announcement that he had reached the N. Pole, assisted

by two Eskimo, one of whom he called Etukisook. A few days later Lt (afterwards Adm.) Robert Peary, U.S.A. Navy, returned after his discovery of the Pole, and denounced C.'s claim. Sworn statements by companions and accomplices discredited his pretensions; and, after his alleged proofs were rejected by Copenhagen Univ., he sank into obscurity. In 1922 he was sentenced to 14 years' imprisonment for fraud in connection with a concern called the Petroleum Producers' Association, and served 5 years of his sentence, which was commuted by President Hoover. Wrote *My Attainment of the Pole*, 1911; *Return from the Pole* (ed. F. J. Pohl), 1953.

Cook, Captain James (1728-79), celebrated navigator, b. Marton, Yorkshire, where his father was first an agric. labourer and then a farm bailiff. He was apprenticed, when only a little over 12, to a haberdasher at Staithes, a vil. near Whitby, but left him owing to a dispute and boarded a ship as collier's apprentice and was very soon made mate. In 1755 C. joined the navy and from then onwards his success in life was assured. On the recommendation of Sir Hugh Palliser he was appointed successively master of 3 sloops, in the last of which he served in the St Lawrence, being present at the capture of Quebec. He was employed in sounding the St Lawrence and pub. a chart of the riv. from Quebec to the sea. In 1763 he surveyed the coast of Newfoundland and the next year was appointed marine surveyor of Newfoundland and Labrador. In this capacity he pub. in the *Philosophical Transactions* an observation of a solar eclipse near Cape Ray. The charts and observations which he drew up on this Newfoundland expedition attracted the attention of the Royal Society, who invited him to take part in an expedition for the purpose of making an observation of the transit of Venus. For this purpose he received a Lieutenant's commission and set sail in the *Endeavour*, a vessel of 370 tons, accompanied by sev. scientific men, including Sir Joseph Banks (q.v.). On 13 April 1769 he reached Otaheite (or Tahiti), where he erected a makeshift observatory and succeeded in making the necessary astronomical observations. From Otaheite he sailed in quest of the great continent which for centuries had been supposed to exist in the S. ocean (see TERRA AUSTRALIS INCOGNITA) and reached the is. of New Zealand, which had remained unexplored since their first discovery by Tasman in 1642. His efforts to reach the interior were baffled by the hostility of the natives, but during the ensuing 6 months he circumnavigated the is. and estab. the existence of the channel dividing New Zealand into two large is. From New Zealand he sailed to New Holland (Australia) and came in sight of Botany Bay, after narrowly escaping disaster on the Great Barrier Reef. Here again the natives were hostile, but, nothing daunted, C. explored the coast and took possession of it in the name of Great Britain, naming it New S. Wales. Thence he sailed to New Guinea and to Batavia,

where his much-battered ship was repaired. He arrived in England on 11 June 1771, and was at once promoted to captain's rank and put in charge of a second expedition. He now started out in command of the *Resolution*, a ship of 462 tons, and a smaller ship, the *Adventure*, of which the combined crews numbered 193 men, the object of the voyage being to pursue the quest of the great S. continent. Setting sail from Plymouth on 13 July 1772, he touched at Madeira and the Cape of Good Hope and explored the specified lat. He made the first crossing of the Antarctic Circle 16 Jan. 1773, but was driven N. and, after wintering at the



CAPTAIN COOK

Engraving from a painting by Dance.

Society Is., so naming them in honour of the Royal Society, he made further explorations eastward and, turning northwards, navigated the S. tropic from Easter Is. to the New Hebrides and discovered the is. which he named New Caledonia. C. always showed a kindly interest in the natives and his kindness mostly won their confidence, as for instance in Tahiti. As a good example of his interest in the natives of the Pacific there may here be mentioned the case of 'Omai,' as he was known to his Eng. friends. Omai was a young native of Huahine, in the Society Is., whose intelligence and engaging manners had brought him in 1773 to the notice of Capt. Furneaux, commanding the *Adventure* and C.'s second in command. With C.'s concurrence, Omai was taken in the *Adventure* to England, where he was received by George III, and for 2 years was lionised by London society as an attractive specimen of the 'noble savage' recently popularised by Rousseau; and finally, in 1776, brought back to Huahine by C., who took good care that the chiefs should make an appropriate grant of land

to a fellow islander who had received the gift of a sword of honour from the King of England. In 1774 C. sailed as far as the Fiji Is., anchoring off Vatoa or Turtle Is. in S. Lau. After yet another attempt, during which he reached his most southerly lat. in lat. $70^{\circ} 10' S.$, long. $105^{\circ} 54' W.$ on 27 Jan. 1774, he gave up hope of finding land and sailed for home. Arrived back in England once more, he was promoted to the rank of post-captain, made a member of the Royal Society, and awarded the Copley Medal. He had cruised for more than 3 years in the Pacific and S. oceans and during the whole voyage he lost only 1 man through scurvy, an unparalleled triumph of discipline coupled with a scientific realisation of the causes of that disease. Above all, he had dealt the death-blow to the age-long myth of the unknown S. continent, a negative result of his explorations the political implications of which were as important as the geographical (see on this Cook and the Opening of the Pacific, by James A. Williamson, 1946). The attention of the gov. was now directed to the discovery of a N.-W. passage and C. volunteered to lead the expedition. His last and fatal voyage was begun on 25 June 1776, C. sailing in the *Resolution*, and his second in command, Capt. Clerke, in the *Discovery*. In the course of his voyage he discovered the Sandwich Is. (or Hawaiian Is.), which he named after the earl of Sandwich; he then proceeded to America, penetrating into what was afterwards called C.'s Inlet. Prevented from proceeding any further by a wall of ice, he returned to the Sandwich Is., where he met a premature end in 1779 in Kealakekua Bay in the is. of Hawaii in a dispute with the natives about one of the boats of the *Discovery* which had been stolen. To recover the boat C. had seized the person of the king until reparation was made. He landed the next day, when a scuffle ensued which compelled the party of marines who had accompanied him to retreat to the boats, C. being the last to withdraw, and when he was nearing the shore he was struck from behind, the marines being unable to render any assistance. It is one of the ironies of hist. that the man who of all Pacific explorers was the most humane and considerate towards natives should have lost his valuable life in an unimportant encounter with a few pilfering natives. C., in addition to his achievements as a navigator, performed great services for his country in his geographical and scientific investigations. In 1934 his cottage in Great Ayton was presented to the Gov. of Victoria, and transported to Melbourne for re-erection in the Fitzroy Gardens. The original deeds transferring the land to him and bearing his signature are also in the possession of the Victorian Gov. His works are *An Account of a Voyage round the World* (first printed in John Hawkesworth's *Voyages*, 1773, ed. by W. J. L. Wharton, 1893); *A Voyage towards the South Pole and round the World*, 1777; *A Voyage to the Pacific Ocean*, 1784. See A. Kitson, *Captain*

James Cook, the Circumnavigator, 1907; G. Campbell, *Captain James Cook, R.N., F.R.S., Circumnavigator of the Globe*, 1936; H. Carrington, *The Life of Captain Cook*, 1939; J. B. Muir, *The Life and Achievements of Captain Cook*, 1939; J. A. Williamson, *Cook and the Opening of the Pacific*, 1946.

Cook, Sir Joseph (1860-1947), Australian free trade statesman, b. Silverdale, Staffordshire, England. At the age of 9 he worked in a coal mine. He went to Australia in 1885, and in 1891 was elected for Hartley in the New S. Wales Legislature. He was postmaster-general, 1894-8; and minister of mines and agriculture, 1898-9. Became a member for Parramatta in Commonwealth Parliament, 1901; and so remained for 20 years. He was minister for defence in Deakin's (q.v.) Gov., 1909-10. On the defeat of Fisher's (q.v.) Labour Gov. in 1913, C. became Prime Minister, but with a minority in the Senate, so that he soon had to resign. He held office under W. M. Hughes as minister of marine, 1917-20; and as commonwealth treasurer, 1920-1. He was a representative of Australia at the Versailles Peace Conference, 1919. From 1921 to 1927 he was high commissioner in London for the commonwealth; and in 1922 senior Australian delegate to the third assembly of the League of Nations.

Cook, Thos., & Son Ltd, great Eng. firm of tourist agents. The founder, Thomas C. (1808-92), was b. at Melbourne in Derbyshire, and was successively a gardener's help, a wood-turner, a printer, and a Bible-reader and local missionary. In 1836 he became a total abstainer and took a great interest in the temperance movement, founding the *Children's Temperance Magazine* in 1840. It was in connection with this subject that he first conceived the idea of organising parties for travelling. He persuaded the Midland Counties Railway Company to take 570 passengers from Leicester at a return fare of one shilling, this being probably the first publicly advertised excursion. This experiment was so successful that Thomas C. continued to organise such parties, and gradually enlarged his operations. In 1865 the business was removed from Leicester to London. In 1866 the first tours to the U.S.A. were arranged, and in 1869 to Palestine. In 1882 the services of the firm were commissioned in the suppression of Arabi Pasha's rebellion to convey Sir Garnet Wolseley and his suite to Egypt and transport the sick and wounded. In 1884 it conveyed Gen. Gordon to the Sudan, and later in that year the Gordon relief expedition, which included 18,000 troops. Shortly afterwards the firm organised the Moslem pilgrimage from India to Mecca and Medina. On the death of J. M. Cook in 1899, the control of the business passed to his sons, one of whom, Frank C., was chairman until his retirement in 1929. A fusion of interests was arranged in 1928 between T. C. & Son Ltd and its associated companies—including that of T. C. & Son (Bankers) Ltd and the Compagnie Internationale des Wagons-Lits et des

Grands Express Européens—and the business was then organised on a greater scale than ever. Since 1948 the control of the company has been vested in the Brit. Transport Commission. The headquarters of the firm are in Berkeley Street, W.1.

Cook, Mount, in the centre of the Alps in the S. Is. of New Zealand, is the highest mt. peak in Australasia, its altitude being 12,349 ft. It is covered with perpetual snow, and rises in the shape of a pyramid above the other neighbouring

Rarotonga each month, and various small vessels trade among the outer is. Geographically, the group falls into two : the Southern Cook Is.—Rarotonga, Aia, Mauke, Mitiaro, the Hervey Is. (Manuae and Te Au-O-Tu), Takutea, Aitutaki, and Atiu; and the Northern Cook Is.—Suwarrow, Palmerston, Penrhyn (Tongareva), Manihiki, Rakahanga, Pukapuka, and Nassau. Main exports are citrus fruits, tomatoes, copra, bananas, and pearl-shell; the total value of exports in 1953 was £351,542. Pop. in 1954, 15,657.



E.N.A.

COOK ISLANDS: HULA DANCERS OF RARATONGA

peaks. The Rev. W. S. Green nearly reached its summit in 1882. Fyfe ascended it in 1895, and Turner in 1906. See Freda, du Faur, *The Conquest of Mount Cook*, 1936; R. L. G. Irving, *Ten Great Mountains*, 1940.

Cook Islands, archipelago of small is. in the Pacific, lying between the Society and Samoan Groups, between lat. 8° and 22° S. and long. 156° and 167° W. The group, whose is. vary from high volcanic to coral atolls, is fertile and beautiful, and inhabited by an attractive and intelligent race of Polynesians. The is. were discovered by Capt. Cook in 1773, and declared to be under Brit. protection in 1888. In 1901 they formally became part of the Dominion of New Zealand. They are administered by the dept of is. ters. of the New Zealand Gov. at Wellington, through a resident commissioner at Rarotonga. The New Zealand Gov.'s merchant vessel *Maui Pomare* calls at

Cook Strait, strait between N. and S. Is., New Zealand, discovered by Capt. Cook in 1770. A project to cross it with a submarine power transmission cable was formulated in 1956.

Cooke, Benjamin (1734–93), composer and organist, son of a London music-seller. He composed anthems and other sacred music, a highly original setting of Collins's 'Ode on the Passions,' and also popular glees, 'How Sleep the Brave' and 'In the Merry Month of May.'

Cooke, Sir William Fothergill (1806–79), engineer, served in Indian Army (1826–1831), studied medicine at Paris and

of railway signals, and in 1845 patented the single-needle apparatus. C. formed a company in 1846, and he and Wheatstone received the Albert gold medal in 1867.

Cookers, see COOKERY.

Cookery, art of dressing and preparing food for human consumption by the application of heat. The names given to different kinds of C., which are considered below, arise from the various degrees and kinds of heat to which the raw materials employed are exposed during this process.

THE EFFECT OF COOKING ON FOOD.—Cooking increases the value of certain foods in numerous ways, but destroys some vitamins, particularly vitamin C (antiscorbutic), therefore fresh vegetables and fruit should be taken daily to make up for this loss in cooked food. Performed while the material is fresh, cooking considerably postpones the beginning of putrefaction, and it kills harmful germs which may have infested the substance. The process brings out the flavour of the raw material in such a way as to make it more pleasing to the palate, thus increasing appetite and, by stimulating the flow of the gastric juices, materially aiding digestion. Lastly, and most important, the main aim of C. is, by recognition of and attention to the laws of chem., involved, to render food more digestible than in its uncooked state. Research and experience have evolved various general principles which may be applied to the various classes of food. One of the chief of these, for instance, applies to the coagulation of albumen, a substance present to a large degree in animal food. Coagulation of albumen, as seen in the white of a soft-boiled egg, is desirable, and is always attained by exposure to a gentle heat, but continued exposure to a temp. at or above the boiling-point results in the hardening of the albumen into a leathery substance extremely difficult of digestion. Thus in cooking meats the aim of the cook should be to obtain a thin outer covering of this hardened albumen, which will prevent the escape of the meat juices, by first applying considerable heat, but, to prevent the toughening of the interior which would be consequent upon hardening of the albumen throughout, removing to a lower temp. as soon as this protective shell has been formed. All starchy foods are rendered more digestible by the application of dry heat, which converts the insoluble starch into soluble dextrin and sugar. The science of C., to which considerable attention is now paid in schools, institutes, polytechnics, etc., under the general title of Domestic Science courses, is of comparatively recent origin, being practically a product of the 19th cent. The same may be said of the development of C. as a fine art, since the methods employed in the preparation of food for even the famous feasts of ant and medieval days were few and more or less crude, depending for success on the hearty appetites and unrefined palates of the people, while the lower classes cooked their food in the most primitive fashion. Early and medieval Eng. feasts seem to have been distinguished by the immense quantities consumed, both of food and drink, rather than by the quality of the

dishes served, while such recipes as have reached us are remarkable for the number and apparent incongruity of the ingredients employed. The art of C. may be said to have begun in Italy at the time of the Renaissance, and from there spread to France, which soon became its headquarters. The cultured simplicity of It. C. seems to have been introduced into France by Catherine de' Medici, and was developed by famous chefs whose names are immortalised in the titles of their inventions, under the patronage of Louis XIV and Louis XV. Fr. C. still remains the ideal of high-class culinary operations.

METHODS OF COOKING.—*Broiling*, probably the earliest known process of cooking meat, consisted in exposing the surface to direct heat, so that the outside of the meat was well browned, and the inside rendered tender and juicy. The primitive method of broiling meat was by burying it in hot ashes; but the process, when now used, is performed over a clear fire on a gridiron or similar appliance. The meat is turned during broiling by a pair of tongs, as a fork would cause the juices to escape. Small birds, such as quails, may be excellently broiled in about 10 min.; white meat as a rule requires longer cooking than red.

Grilling is not so well done before a fire as over it, as one side of the meat is in the former case exposed to a current of cold air. The average time for grilling is 5 min. for a steak 1 in. thick, 10 min. for a steak 1½ in. thick, and 20 min. for a steak 2 in. thick; but many foods such as steak, cutlets, bacon, fish, etc., can be cooked in a few minutes under a gas or electric grill.

Roasting is really the application of the principles of broiling to larger joints of meat, for which it is an economical process and one producing excellent results. As in broiling, exposure to the greatest heat should come at the beginning of the cooking, so that the meat juices are sealed up and the joint, when cut, exudes a rich, reddish gravy. The interior of the joint should then be allowed to cook in a rather gentler heat, by means of which the fibres are loosened, the connective tissue is changed into gelatin, the fibrin and albumen are oxidised, and the fat cells broken. The fat and tissues on the surface of the meat become caramelised and browned, and acquire a distinctive odour and flavour. The joint should be frequently basted with melted fat in order to prevent evaporation of the watery portion of the meat juice. Meat roasted before an open fire is much more wholesome than when baked in an oven, as the volatile empyreumatic oils produced on the surface are allowed to escape. Roasting is, however, possible only before an open range. The time required for roasting is from 15 to 20 min. for each pound of meat, white meat taking longer than red. Meat can be roasted in a thick saucepan by melting sufficient fat to cover the bottom, and when hot putting in the meat, browning it on all sides, covering with a lid, and continuing to cook over a low heat.

Baking is now the usual substitute for roasting meat in an oven. It is placed in an open tin and heat applied all round at once, instead of to one side at a time; but baked meat, owing to the reabsorption of the volatile products which cannot escape in the closed oven (this does not apply to ventilated ovens, such as gas and the latest electric stoves), is neither so digestible nor so delicate in flavour as roasted meat. Baking is also applied to

meat, and various other ingredients, such as root vegetables and herbs, may be added to the meat and cooked together with it. Since none of the constituents of the materials used can escape, stewing is a most economical method of cooking, and is rendered doubly so by the fact that coarse and tough meat may be rendered palatable, tender, and digestible by its means. In many ways it is the ideal method of cooking meat, but success



PANEL FROM THE BAYEUX TAPESTRY
(Illustrating the preparation of meat for a feast)

other kinds of food besides meat, e.g. fish is more appetising when baked. It can either be wrapped entirely in greased paper, so retaining all the flavour, or laid in a greased casserole, with dabs of fat placed on top. Pies containing either meat or fruit are usually baked, and a meat pie possesses many advantages over plain baked meat, since the surface is protected from charring by the crust, and the meat practically stews in its own juices. All forms of pastry, such as pasties and open tarts, are baked, and require a hot oven. The latter should be placed at the top of the oven to begin with, but after the material has risen sufficiently removal to a cooler lower shelf is usually advisable to ensure thorough cooking of the interior. The heat of the oven should also be reduced. Especial care should be taken to close the oven door gently during the early stages of cake baking, or the risen mixture may collapse. Cakes require a wide range of temp. Plain cakes and scones are baked at a high temp.; rich cake mixtures and ginger-breads are baked at a lower temp. Similarly the initial cooking temp. for plain yeast mixtures is high, while richer varieties are baked at lower temps. Milk puddings are baked in a slow oven. Modern electric or gas stoves are fitted with heat regulators which automatically maintain the oven at any desired temp., and in consequence less attention is necessary during the actual cooking of the food.

Stewing is the slow cooking of food in a little liquid in a closed vessel. It is the method recommended for tough fibrous

depends on keeping the temp. below about 180° F. Lean meat is best for stewing; it should be cut into convenient pieces and slightly browned by frying in fat previous to being placed in the stewpan. It should then be covered with water or stock, and set to cook for 3 to 5 hrs., particular care being taken to prevent boiling, so that the albumen does not harden, and the meat cooks in its own gradually extracted juices. Vegetables, flavourings, and thickening matter may be added as desired. The principle of stewing is also employed in the making of broth, and of soup or beef tea. Meat and bones for the making of soup should be placed in cold water and gradually raised to boiling-point, so that the escape of meat juices into the liquid is not hindered by hardening of the albumen. Since, however, it is not desired to eat the solid constituents, bone stock is boiled slowly for sev. hours in order to extract the gelatinous matter. It is this gelatine which causes soup to form a jelly when cold, but contrary to belief it has no great food value. By the addition, however, of vegetables, and starches such as corn-flour, barley, oats, etc., or nitrogenous matter such as cheese, macaroni, beans, or lentils, thick or cream soups are nourishing, as well as stimulating. Vegetable water or vegetable stock also makes a good basis for soups. Stewing is also a common method of cooking fruit, by making a syrup of sugar dissolved in warm water, and adding the fruit, which is cooked gently, but not boiled.

Braising is a combination of stewing and baking, or pot roasting. It is an

excellent method of cooking meat, because the cheaper cuts or tougher joints become tender after being treated this way. The meat is fried, after removing the surplus fat, in a small quantity of hot fat for a few minutes until the outer covering is sealed and browned all over, and then it is removed from the pan. A liberal quantity of sliced root vegetables is lightly fried in the fat, and then placed in a saucepan or casserole, with water or stock half covering them; seasoning and a *bouquet garni* being added. The meat is then placed on top of the vegetables, and the saucepan or casserole covered with a lid; the contents being cooked over a low heat or in a slow oven for 2 to 3 hrs. Poultry, game, and root vegetables may also be cooked this way.

Boiling, or cooking by immersion in boiling water. This method is used for fresh or salted meat, game, and poultry. The temp. of the water should, however, be reduced 5 min. after the immersion of the meat (i.e. sufficient time to seal the outer covering), otherwise there is a serious risk of toughening of the connective tissue if boiling is continued. Coagulation of proteins, as in the case of the egg, takes place in a temp. of about 180° F., and an egg cooked in this temp. for 10 to 15 min. is more easily digested than one kept at boiling point. The usual method of cooking eggs by boiling for 3½ min. is far from ideal, as it allows the albuminous white to become overcooked while leaving the yolk underdone. A much better plan is to place the eggs in boiling water (half a pint to each egg) and leave them in the gradually cooling water for about 20 min. The same can also be said of meat, and it is desirable to see that the temp. of the water does not rise much above that required for the coagulation of egg protein. This method can also be applied to fish, but to retain the flavour steaming or baking is preferable.

Certain semi-liquid foods, such as milk puddings, jams, and jellies, are cooked by boiling the substance itself, constant stirring being necessary in such cases to prevent burning. Allied to boiling is *steaming*, for which the food is placed in a covered vessel having a perforated bottom which fits tightly over a saucepan of boiling water. Steaming takes rather longer than boiling, but is preferable in many ways, giving a finer flavour, and preventing the surface of puddings from becoming sodden through contact with water.

Vegetables should not be cooked too long, or at too high a temp., otherwise valuable vitamins and salts are lost. They can be steamed; cooked conservatively, i.e. in a little water; or braised. Most vegetables when grated can be eaten raw with salad or in sandwiches, and they are very nutritious taken this way. Green vegetables should be fresh; washed thoroughly, care being taken not to bruise the leaves; and they should not be left in water for more than a few minutes. Root vegetables should be scrubbed, and if necessary peeled very thinly.

Conservative cookery is the method

recommended for vegetables, as only a little water is used and the flavour, valuable salts, and vitamins are retained, or conserved. Green vegetables should be shredded coarsely and put into very little boiling water (about ½ pint to 1½ lb. of vegetables), covered with a lid, and tossed occasionally to prevent burning. Attention is needed during this method of cooking, which does not take more than 10 to 15 min. The vegetables should be removed from the heat immediately they are cooked, and eaten at once. When cooking spinach it is unnecessary to add any water. A teaspoonful of fat may be added during, or after, cooking the vegetables. Carrots are delicious sliced and sautéed (i.e. cooked in a little hot fat) for a few minutes, a tablespoonful of water added, and then cooked for about 10 min. in a covered pan. Vegetables are more appetising and nutritious when cooked conservatively than by the old method of boiling them in plenty of water. Potatoes are more nutritious when cooked in their skins, after being well scrubbed. They can be boiled gently or baked in the oven. The reason for cooking potatoes in their jackets is that the layer nearest the skin is considerably richer in mineral matter and protein than the outer flesh and central core; and the flavour is enhanced when potatoes are cooked this way. If it is impossible to retain the skins, then potatoes should be peeled very thinly, and conservatively cooked. The water in which vegetables are cooked can be salted, iodised salt being recommended; but soda must not be added as it destroys vitamins. Vegetable water should not be thrown away, but used for soup or gravy.

Vegetables can be cooked in a waterless steamer, but boiling is preferable as there is less loss of vitamin C. Steam pressure cooking has the advantage of economy of fuel, food, and time, but it is considered by some dieticians and doctors to destroy valuable substances in the food owing to the high temps. used (212°–280°).

Frying, or cooking by hot fat, is of 2 kinds, wet and dry. The former, which is much the preferable, is done in a deep frying kettle containing lard, butter, dripping, or cotton-seed or olive oil. The fat should be gradually heated up to almost 400° F., when it is perfectly still and gives off a faint bluish vapour; the articles to be fried are then immersed, being usually enclosed in a wire basket for ease in handling. Fried food should be crisp, golden-brown in colour, and non-greasy, any superfluous fat on the surfaces being removed by placing the articles on absorbent paper. Fish, cutlets, croquettes, fritters, potatoes, chops, etc., are delicious when well cooked in this way, and many foods are, for this method of cooking, first rolled in beaten egg and breadcrumbs or in batter. Dry frying is performed in a shallow frying-pan the bottom of which is covered with hot fat. It has many disadvantages; the food is apt to be unequally cooked, greasy, and charred, and has to be constantly turned. Bacon, sausages, chops,

etc., are cooked thus in their own escaping fat, while eggs, cold potatoes, and pancakes may be dry fried in a little dripping or lard. This method of frying is also known as sautéing. All fried food should be served immediately it is cooked.

PROCESSES ALLIED TO COOKERY.—Other forms of C. include *blanching*, i.e. putting food into boiling water for a few minutes, and then plunging into cold. This helps to remove easily the peel of tomatoes, peaches, almonds, etc. Another way of blanching is by putting the food into cold water, bringing it to the boil, and plunging again into cold water: this method is used in the preparation of certain kinds of offal. To *caramelise* is to heat sugar gently until it turns brown, when it can be used for caramel custard or caramel rice; *parboiling* is partly or half boiling, the cooking being continued in another way. For instance, potatoes are more easily digested if parboiled before roasting, also a bullock's heart is rendered more tender when cooked in this manner. *Pasteurising* is the quick raising of the temp. of milk to 145° F., and keeping it there for about half an hour, then cooling it rapidly; *scalding* is heating a liquid just below boiling-point: milk, for instance, is treated this way to prevent it becoming sour quickly in hot weather; *searing* is forming a coating over the surface of meat; *sousing* is cooking food slowly in vinegar and spices: herrings and mackerel can be cooked this way; and *sterilising* is boiling. Milk is often treated this way to prevent souring, and to kill harmful germs, but at the same time vitamin C is destroyed. 'Steam under pressure is a much more effective method of sterilising material containing bacterial spores, and a temp. of 115–20° C. for 15 min. is always to be relied on for sterilisation' (C. E. Dukes).

BEVERAGES ASSOCIATED WITH COOKERY.—Tea, coffee, and cocoa are the beverages generally taken in Britain. Tea is the most popular and has the most varieties, dependent upon its place of growth, and according to the different leaves from which it is produced. Chinese teas have the most delicate flavour, Indian teas have the greatest degree of astringency, particularly Assam tea, which is usually used for blending with milder varieties. Ceylon teas have a rich flavour. In judging a tea one should look for a reddish-golden coloured liquid, the infused leaves should be of a bright coppery tint and evenly extracted, and there should not be much stalk with the leaves, which should not be completely unrolled after 5 min. infusion. The proper method for making tea is important; fresh water should first be brought to the boil, and the teapot thoroughly warmed so as to maintain the temp. in order to extract the finest flavour from the tea. Infusion should not be more than about 5 min., and after this the liquid, without the leaves, should be poured off into another hot pot; otherwise too much tannic acid is extracted, along with other bitter substances. Coffee is consumed on the Continent and in America more than in

Britain. There are sev. varieties of bean, such as Mocha, Mysore, Jamaica, Kenya, Ceylon plantation, Costa Rica, Java, and Brazil. Fr. coffee usually contains chicory, which is the root of the wild endive. It is not detrimental to health, and is considerably cheaper than coffee beans. Coffee should be made strong and hot, and the beans should be freshly roasted and ground. For *café au lait* 1 part of milk to 1 of coffee is about the proper proportion. Coffee is sometimes served iced. Cocoa has a certain proportion of fat and starch, and because of the latter it should be boiled for 1 or 2 min. before serving.

There is no food value in tea or coffee, and excessive indulgence, especially in the former, may affect the nervous system or the digestion. Tea and coffee are stimulants, and it is therefore better not to take them at night. Cocoa has very little food value, except when made with milk and sugar. Certain proprietary preparations which contain malt extract, eggs, milk, and cocoa are sometimes used as substitutes for the above beverages.

Fruit drinks can be made from fresh fruits or canned fruits, and are very refreshing when served iced. Barley water may be added to make a demulcent drink suitable for the sick room, or as a beneficial drink in hot weather.

COOKING UTENSILS.—Various kinds of mills for special forms of C. have been devised and perfected. Nowadays, however, gas and electrical equipment is used increasingly, owing to its cleanliness and saving of time. Refrigerators are used for storing and keeping food fresh; and various types of thermometer are available for testing the temp. of ovens, milk, sugar, and fruit during preserving. The following are some of the small electrical appliances which are available, either in Britain or America, for the preparation and cooking of food and beverages: bean cutters; boiling rings; boiling plates; breakfast cookers; chafing dishes; casseroles; coffee mills, percolators, and brewers; double saucepans; drink mixers; egg poachers, or steamers; food mixers; freezers; hot cupboards; hot-water urns; ice-cream freezers; domestic, tourist, and whistling kettles; mincing machines; mixers; potato peelers; roasters; steamers; automatic toasters; warming plates; and waffle irons.

COOKERS.—There are a variety of cooking stoves: *oil cookers* with or without wicks; *solid fuel cookers*, which burn coal, coke, wood, peat, or a smokeless fuel such as anthracite, coke, or charcoal; *gas cookers*, working from a mains supply or using *Calor Gas*, which is a portable fuel, delivered in small steel cylinders, the gas being stored in liquid form; and *electric cookers*. *Solid fuel cookers* include the cottage and kitchen ranges, made of cast-iron, and sometimes coated with enamel; *combined cookers* can be fitted in a living-room, in appearance are like an ordinary fireplace, and are available in various colours. The one fire heats the room, an oven, a hot chamber for plates, boils and grills, and provides hot water for

baths, etc. *Back-to-back* grates have an open fire in a sitting-room (which can be shut off) with the oven and hot plate in the kitchen, and this stove also supplies hot water. *Stored-heat* cooking stoves are usually made of cast iron with heavy iron or steel blocks above the fire. The stoves are covered with a highly glossed vitreous enamel, and contain hot plates which can be covered with insulating lids when not in use; there are separate ovens for roasting, stewing, warming plates, etc. The stoves are insulated with asbestos, and consequently the kitchen never becomes over-heated. The first cost of the stored-heat cooking stoves is high, but there is considerable saving in fuel and labour. Unfortunately they are not usually designed to heat water, but water heaters may be provided. *Gas* cookers are usually the open type of cooker, or the enclosed streamlined cabinet type, which is easier to clean and has a better appearance. They are made of cast iron or steel, with a vitreous-enamel finish. The majority of those in Great Britain are of the vertical design, i.e. with the grill and oven under the hot plate. The horizontal, table-top design, which raises the oven to an easier working level, is not so popular as it occupies more floor space. Many cookers are fitted with a thermostatic control, i.e. by the turning of a dial desired temp. can be maintained. A simmering burner is a useful addition. *Electric* cookers are also in vertical or horizontal designs, most are thermostatically controlled. In order to obtain the utmost efficiency and economy it is essential to use the ground base utensils. There may be glass inner doors to the oven, or drop-down doors, and some models are fitted with time switches and control clocks. The fireless cooker, in which food previously heated to boiling-point is kept at a high temp. for hours by surrounding it with a thick layer of non-conducting material, such as felt or hay, deserves to be better known than it is.

THE KITCHEN should be well equipped and planned. Anything from 12 to 18 hrs per week is spent on the preparation and cooking of meals in the ordinary household, and an additional 7 to 10 hrs on washing up. It is, however, possible to reduce this to a minimum by the rearrangement of big equipment and utensils. The ideal kitchen need not be a large room, 8 ft by 10 ft or 8 ft by 13 ft being quite large enough for easy and efficient working. In fact in some Amer. flats a space 6 ft 4 in. by 4 ft 2 in. has been successfully converted into a completely equipped kitchen by careful planning and utilisation of every piece of wall space. Recommendations for the ideal kitchen are light-coloured, washable walls, tiled or enamel painted; floors covered with linoleum, or composition flooring, with something warm for the worker to stand on; good ventilation and light; all doors flush, i.e. no ledges for collection of dust; the cooker, cabinet, and refrigerator adjacent to the sink, which can be double or single with double

draining boards; and built-in cupboards reaching to the ceiling to avoid dust traps. All working surfaces should be covered with plastic or other non-absorbent material.

The foods and drinks we are accustomed to consume may not, in fact, be the best for us. Varying costs of different foods often govern their general use; but habit can also be an important factor (e.g. tea drinking, and tobacco smoking). At the beginning of the last century tea was consumed at an average of about 1½ lb. per head of the pop. per annum, but now it is about 6 times that amount; and in Britain more tea is consumed than in all other European countries together. It is well sometimes to consider our general diet, together with the effects of cooking, in relation to health. Good C. is now recognised, as has been said, as a science and an art, and the study of kindred subjects, such as diet, food, and nutrition, will give the student, cook, or housewife useful facts as a basis to work on, so enabling a proper selection to be made from the foods that are available at the time, and preparing them to the best possible advantage. See FOOD AND DIET; HOMEMAKING; PRESERVING; PRESSURE COOKERY; SALAD; VITAMINS. See books on C. by Sir J. Elliott, 1539, and Abraham Veal, 1575; R. May, *The Accomplished Cook*, 1665; Dr. Pegge, *Forme of Curry*, 1780; A. Brillat-Savarin, *Physiologie du goût*, Paris, 1825; Mrs. Beeton's C. books; R. Hutchinson and V. H. Mottram, *Food and the Principles of Dietetics*, 1933; E. and L. Bunyard, *The Epicure's Companion*, 1937; A. L. Simon, *André Simon's French Cook Book*, 1938; W. G. R. Francillon, *Good Cookery*, 1938; Constance Spry, *Come into the Garden, Cook!*, 1942; Margaret Y. Brady, *Health for All, War-time Recipe Book*, 1942; Mrs. A. Webb, *Preserving*, 1947; *Good Housekeeping Cookery Book*, 1948; Marjorie B. Russell, *Cooking by Magic* (pressure C.), 1948; W. Midgley, *Cookery for Men Only*, 1948; N. Spain, *Mrs. Beeton and her Husband*, 1948; I. S. Rombauer, *The Joy of Cooking*, 1953; D. Lucas and R. Hume, *Au Petit Cordon Bleu*, 1953; C. Spry and R. Hume, *The Constance Spry Cookery Book*, 1956.

Cookham, par. and vil. in Berkshire, England, on the Thames, 27 m. from London. A great fishing resort. Pop. 4500.

Cooking Utensils, see COOKERY.

Cookstown, mkt tn of co. Tyrone, N. Ireland, 13 m. N. of Dungannon, and a centre of the linen industry. Its main street is 1½ m. long. Pop. 4200.

Cooktown, coast tn in Queensland, Australia, situated at the mouth of Endeavour R., 1359 m. N. of Brisbane. Industries: cotton, peanuts, fruit growing, pastoral (cattle), timber, mining—tin and gold. Pop. 406.

Coolbrith, Ina Donna (1847–1928), Amer. poet, b. Illinois. Her parents early in her youth migrated to California, where she spent most of her life. For 20 years she was a librarian. Much of her poetry is coloured by her experiences of life in the

mining dists. of California, and recalls the work of Bret Harte, with whom she was associated in editorial work on the *Overland Monthly*. She has been called the Sappho of the West, and the esteem in which her poetry was held earned for her the title of poet laureate of California, which was conferred on her by the governor and legislature in 1895. Chief pub.: *A Perfect Day and other Poems*, 1884; *The Singer of the Sea*, 1894; *Songs from the Golden Gate*, 1896.

Coolgardie, tn of W. Australia, situated 360 m. from Perth. It was an extremely busy mining centre following the sensational gold finds in 1892-3. Its output of gold, however, has greatly declined and its pop. is to-day only 1540. It is, however, an important railway junction on the transcontinental line, and its aqueduct is part of the pipe-line 350 m. long that supplies water to the W. Australian goldfields.



Bachrach

CALVIN COOLIDGE

Coolidge, (John) Calvin (1872-1933), twenty-ninth president of the U.S.A., b. Plymouth, Vermont, of old farming stock, son of John Calvin C. He was admitted to the Bar in 1897. He was a member of the Massachusetts House of Representatives 1907-8, mayor of Northampton 1910-11; member of Massachusetts Senate 1912-15 (president thereof 1914-15); lieutenant-governor of Massachusetts 1916-17-18; governor of Massachusetts (two terms) 1919-20. In this capacity he dealt firmly with the Boston police strikers of Sept. 1919. In 1920 he received the Republican nomination for vice-presidency of the U.S.A., and he assumed office on 4 Mar. 1921. On the death of President Harding he was sworn in as

president (3 Aug. 1923). He was re-elected for the term beginning 4 Mar. 1925, and ending 3 Mar. 1929. As president, C. inherited two scandals from his predecessor—the maladministration of a bureau for war veterans and an attempt to hand over public oil lands to private companies. C. allowed these matters to go to the courts and the guilty ones to be punished. During his term a considerable portion of the national debt was paid off, the income taxes were reduced, and the country enjoyed unexampled prosperity.

Coolidge, Susan, pseudonym of Sarah Chauncy Woolsey (1835-1905), Amer. writer of children's stories, b. Cleveland, Ohio. Her father's uncle, brother, and nephew were all presidents of Yale. Educ. at private schools in Cleveland, she lived in New Haven, Connecticut, from 1855 to 1870. She is best remembered for her books for girls, which have become classics. They include *What Katy Did*, 1872, *What Katy Did at School*, 1873, and *What Katy Did Next*, 1886; and, among many others, *Eyebright*, 1879, *Cross Patch*, 1881, *Clover*, 1888, and *Just Sixteen*, 1889. She also ed. the letters of Frances Burney and of Jane Austen and wrote a short hist. of Philadelphia.

Coolidge Tube, see X-RAYS.

Coolies (from Tamil *kuli*, hire, or from *koli*, the name of an aboriginal tribe of India), name applied to the unskilled labourers of India and E. Asia, and especially to labourers of this class who have emigrated to other countries, usually under contract. Much difficulty was found in the Brit. sugar-producing colonies after the abolition of slavery in finding labourers for the plantations. The white man was physically unable to undertake the duty, and the emancipated black was unwilling to do so. In these circumstances it was suggested that the overstocked Asiatic countries might supply the need, and agents were sent to India and China to negotiate for the importation of labourers. This traffic started after 1834, and was officially recognised by the Brit. Gov., under whose jurisdiction it mostly fell, 10 years later. There were, however, an enormous number of abuses in the system, and those who knew it well stigmatised it as slavery. Many of the C. were attracted by elaborate promises, and some were kidnapped. They were taken over closely packed in ships and under conditions vividly recalling the slave ships, and on arrival they were practically sold by auction. The only points in which they differed from slaves were in having a regular wage paid to them and in being engaged for only 7 years. The cruel oppression which characterised the whole coolie system soon brought a series of reforms. In 1854 the Brit. governor at Hong Kong forbade Brit. subjects and Brit. vessels to engage or be engaged in the exportation of Chinese C., and his action was confirmed in the following year by the Chinese Passengers Act, which made most stringent regulations for the trade, particularly with regard to the actual sea voyage. After this the business

of importing C. into S. America and the W. Indies was transferred to Portuguese traders, and was carried on from Macao. From this port the old system was resumed, and became, if possible, still more of a slave trade. The extension of the trade to Canton led to a fresh outburst of indignation, and further legislation was carried out, this time by the Portuguese authorities. This was practically inoperative, however, and things continued with periods of reform and deterioration until 1866. In that year a conference was held by representatives of the Brit., Fr.,



CHINESE COOLIE

E.N.A.

and Chinese Govs. China insisted that the contract should include the payment of the C.' return fare at the expiration of 5 years, and this put an immediate stop to the trade with the W. Indies, where permanent labourers were required. From this period the C. for Brit. colonies were drawn largely from India. Immigration of C. from India was prohibited in 1838, but the ban was removed in 1845, when the introduction of E. Indians into Brit. Guiana and Trinidad under indenture started. It continued annually—except in 1849–50—under the supervision of the Colonial and Indian Govs., being regulated by the Indian Emigration Act of 1883. This Act allowed emigration only to certain colonies where good treatment was assured. These were Brit. Guiana, Natal (then a colony), Jamaica, and most of the other Brit. W. Indian is.; the Fr. colonies of Guadeloupe

and Martinique, Dutch Guiana (or Surinam), and the then Danish (now Amer.) W. Indian Is. of Sant Croix. The immigration of Indian C. into the W. Indies was, however, terminated by the Gov. of India in 1917. Until recently coolie labour was employed in Singapore on work on aerodromes, but it has now ended (see Annual Labour Report of Singapore for 1947). After 1904 a large number of C. were imported from China by the Transvaal authorities for work on the Rand, much against the wish of the Boers. This led to many difficulties and complications, largely on account of the compound housing plan. See CHINESE LABOUR QUESTION.

Cooma, tn in New S. Wales, Australia, 268 m. SSW. of Sydney, at an altitude of 2700 ft. With high mts in the vicinity, it is the centre of an Alpine region on the flanks of the pastoral dists. of the Monaro and Murrumbidgee R.s. C. is the H.Q. of the Snowy Mts Hydro-Electric Authority (q.v.). Pop. 7240.

Coomaraswamy, Ananda (1877–1947), writer on Indian and Sinhalese art; b. Ceylon, educ. London Univ. He worked for 3 years in the mineralogical survey dept of Ceylon, but, conscious of the threat to the survival of the traditional arts of India and Ceylon, he returned to England to join a movement of protest at the destructive effects of industrialism and the impact of European art on Indian culture, and for 45 years he was engaged in reconciling the W. with Indian art and thought. Fellow for research in Indian, Persian, and Mohammedan art at the Museum of Fine Arts at Boston, where he built up collections of oriental art and produced elaborate and scholarly catalogues of them. The list of his pubs. shows him as the pioneer in a largely uncharted field: *The History of Indian and Indonesian Art*, pub. by the Royal India Society, of which he was one of the founders, 1910, and by the Boston Museum; *Rajput Painting* (2 vols.), pub. by the Oxford Press in 1916, which marked an epoch in the appreciation of Kangra painting in the W.; and *The Transformation of Nature in Art*, 1934.

Coomassie, see KUMASI.

Coon, see RACCOON.

Cooper, Abraham (1787–1868), painter whose work, consisting of over 400 pictures, is mostly battle scenes and race-horses. The best-known are those of 'Waterloo,' 'Bosworth Field,' and 'Marston Moor.'

Cooper, Sir A. Duff, see NORWICH, VISCOUNT.

Cooper, Anthony Ashley, see SHAFTESBURY, EARLS OF.

Cooper, Sir Astley Paston (1768–1841), surgeon, b. Brooke, near Norwich. He early devoted himself to the study of anatomy, attending first the lectures of John Hunter and then at St. Thomas's Hospital, where in 1789 he was appointed demonstrator of anatomy. In 1800 he became surgeon to Guy's Hospital. His paper on perforation of the tympanic membrane for relief of deafness due to obstruction of the Eustachian tube (1801)

earned him the Copley medal of the Royal Society, of which he was elected fellow in 1805. He pub. his great work *On Hernia* in 1804-7. In 1820 he removed a small tumour from the head of George IV and was rewarded with a baronetcy. C. was perhaps the greatest surgeon of his day, a masterful operator and indefatigable worker, and an unaffected, courteous, and generous man. Besides teaching at Guy's and St. Thomas's, he is said to have dissected on every day of his working life. He was a pioneer in the surgery of the blood vessels, in experimental surgery, and in the surgery of the ear. He was first to ligate the abdominal aorta (1817) and performed many other daring operations. President of the Royal College of Surgeons (1827), vice-president of the Royal Society (1830). His other works include *Dislocations and Fractures*, 1822; *Diseases of the Breast*, 1829; and *Anatomy of the Thymus Gland*, 1832. See G. Keynes, *Life and Works*, 1922; life by R. C. Brock, 1952.

Cooper, Edith Emma, see FIELD, MICHAEL.

Cooper, Sir Edwin, R.A. (1873-1942), architect, b. Scarborough, was articulated in Yorkshire and began practice 1897. With a succession of partners he won numerous public competitions, leading to a most prosperous career. His chief buildings were Marylebone Town Hall, 1911; the Port of London Building, 1912; the Star and Garter Home, Richmond, 1924; the headquarters of Lloyds, 1929, and the National Provincial Bank, 1931, both in the City of London; various buildings at Tilbury, etc., for the Port of London Authority; the Guildhall and Law Courts at Hull; and sev. hospitals.

Cooper, Gary (real name Frank James Cooper) (1901-), Amer. actor, b. Helena, Montana; educ. at Dunstable School, England, and Iowa College, Grinnell; married Sandra Shaw (née Veronica Balfe), actress. He worked as a newspaper cartoonist and an advertising salesman. College dramatics led to screen work as an extra, followed by small parts in short subjects. His first feature film was *The Winning of Barbara Worth*, and since then he has made many famous films, including *The Devil and the Deep*, *Farewell to Arms*, *Design for Living*, *Lives of a Bengal Lancer*, *Beau Geste*, *Sergeant York* (Academy Award best performance 1941), *For Whom the Bell Tolls*, and *High Noon* (Academy Award best performance 1952).

Cooper, Gladys (Mrs Merivale) (1889-), actress and actress-manageress, b. Lewisham, London, daughter of Charles Wm Frederick C. Married, first, H. J. Buckmaster (marriage dissolved); secondly, 1928, Sir Neville Arthur Pearson (marriage dissolved); thirdly, 1937, P. Merivale (d.). Her first London appearance was at the Vaudeville, 1906, as Lady Swan in *The Belle of Mayfair*. Has appeared in the following (inter alia): *The Dollar Princess*, 1911; *The Importance of Being Earnest* (Cedric Cardew); *Man and Superman* (Violet), 1912; *Milestones* (Muriel Pym); *Broadway Jones*, 1914; *Half an Hour*; *The*

Admirable Crichton (Lady Agatha), 1917; *Trelawney of the Wells* (Clara); *The Man from Blankley's*, all-star (Marjory), 1918; *The Second Mrs Tanqueray* (Paula), 1923; *Magda*; *Peter Pan* (Peter), 1924; *The Last of Mrs Cheyne*, 1927; *The Indifferent Shepherd*, 1948; *Relative Values*, 1951; *A Question of Fact*, 1953; and *The Chalk Garden* (on Broadway), 1955. She has also appeared in a number of films.

Cooper, James Fenimore (1789-1851), Amer. novelist, b. Burlington, New Jersey, of a Quaker family. Brought up in a wild area near Oswego Lake, he gained an intimate knowledge of Red Indian lore. Educ. at Yale, he served for some years in the navy, but he gave that up in 1811, and devoted all his attention to literature. His first book which found its mark with the public was *The Spy* in 1821; this he followed with *The Pioneers* in 1823. He also wrote *The Pilot* in 1823, which estab. him as a leading author, although *The Last of the Mohicans*, 1826, is generally considered to be his masterpiece. At this time C. went to live in France, where he wrote for the *National* on Amer. questions. Whilst he was in Paris he wrote *The Prairie* in 1827 and *The Red Rover* in 1828.

In the year 1833 C. went back to America, where he wrote in rapid succession *Gleanings in Europe*, 1837-8; *Home-ward Bound*, 1838; *The Pathfinder*, 1840; *Mercedes of Castile*, 1840; and *The Deerslayer*, 1841. In 1839 he wrote *The History of the Navy of the United States*. Among his later novels were those of a trilogy known as the Littlepage MS.: *Satanstoe* and *The Chain-bearer*, 1845, and *The Redskins*, 1846. The last years of C.'s life were spent in heated warfare with his critics, and lawsuits followed, from which he nearly always emerged victorious. See life by T. R. Lounsbury, 1882; also Margaret M. Gibb, *Le Roman de Bas-de-Cuir*, 1927; R. E. Spiller, *Fenimore Cooper: Critic of his Time*, 1931; H. W. Boynton, *James Fenimore Cooper*, 1931.

Cooper, Peter (1791-1883), Amer. educationist, manufacturer, and philanthropist, b. New York. He worked with his father in various trades, and in 1828 estab. the Canton Iron Works in Baltimore; in 1830 he constructed the first locomotive in America. He then estab. a factory in New York and furnaces and foundries in Pennsylvania and New Jersey, and did much work in the laying of the first Atlantic cable. As a philanthropist he founded the Cooper Union, an institute in New York to provide for the education of the poorer people. In 1876 he was the presidential candidate of the Greenback Party.

Cooper, Samuel (1609-72), miniature painter, b. London; studied under his uncle, John Hoskins. He painted the portraits of Oliver Cromwell, Charles II, and of most of the celebrated men of the time. He gave to the miniature some of the quality of the large oil portrait and has been termed a Van Dyck on a small scale.

Cooper, Thomas (1805-92), Chartist and poet, b. Leicester. He headed the Chart-

ists in Leicester in 1840, ed. the *Midland Counties Illuminator*, and lectured in the pottery dists. during the riots of 1842, being arrested on a charge of conspiracy and sedition, and imprisoned in Stafford jail for two years. While in prison he wrote *The Purgatory of Suicides*, his longest poem. *The Triumphs of Perseverance* appeared in 1847, and his two novels, *Alderman Ralph* and *The Family Feud*, in 1853 and 1855 respectively. After his release from prison he lectured on politics in London, and on Christianity, and wrote an account of his own life in 1872. See life by R. J. Conklin, 1936.

Cooper, Thomas Sidney (1803-1902), painter, b. Canterbury. He began to earn his living as a coach-painter and as a scene painter, and afterwards became a drawing master in Canterbury. In 1831 he settled in London, and showed his first pictures at the Royal Academy in 1833, enjoying an unprecedentedly prolonged career as an exhibitor. His name is mostly remembered for his hundreds of pictures of cattle or sheep. Some of his works are in the Tate Gallery, the National Gallery, and the Victoria and Albert Museum. A.R.A., 1845, R.A., 1867.

Cooperage: 1. The term applied to the system carried on by Dutch and other foreign vessels called copers about the middle of the 19th cent. of illicitly selling drink and tobacco to fishermen of the North Sea. The fishing powers at the international conference at The Hague, 1887, prohibited the sale of spirits in the North Sea, and in 1888 the North Sea Fisheries Bill was passed by the Brit. Gov., prohibiting the sale of spirits to fishermen.

2. An ancient craft, known to and practised by the Romans. It is the art of making barrels and vessels of similar shape, which are constructed by means of curved staves fastened together by hoops, each stave being widest in the centre and tapering towards each end. There are sev. branches of the industry, and for each branch special coopers are employed. The wet cooper makes casks and barrels for holding liquids, and he is the most skilled of all the coopers; the dry cooper makes vessels for holding dry goods; and the white cooper makes such utensils (now seldom used) as churns, pails, and washing-tubs, where the sides are usually straight and not curved as in the cases of casks and barrels. Machinery is now largely employed in making barrels.

Co-operation. Hardship endured by the industrial pop. in the later 18th cent. and beginning of the 19th cent. and attributed to the working of the competitive system led to the advocacy of C. as an alternative industrial system. Somewhat nebulous early ideas have since been refined and there has emerged a Co-operative Movement in Britain embracing over 12,000,000 individual consumers and about 250,000 farmers. Co-operatives are now known to every continent, and have their place in the advanced as well as the less developed economies. The number of individual co-operators

throughout the world is c. 150,000,000. Activities of co-operatives today include distribution and production by consumer co-operatives; credit, banking, and insurance; marketing of farmers' produce and supply of their requirements and services, e.g. petroleum, transport, and electricity; organisation of co-operative rural communities; workers' productive and service societies and handicraft societies; fishermen's societies for marketing and supply; housing societies for erection and financing; miscellaneous societies including those concerned with health services. Figures in this article relating to the consumer societies are all for 1956; agric. and colonial figures relate to 1955.

Robert Owen (1771-1858) in Britain is sometimes referred to as the father of C. He advocated co-operative industrial communities and productive societies which would support such communities. He organised co-operative congresses. Whilst most of his co-operative experiments failed, many of his supporters played a part in laying the foundation of the movement which later developed. Dr Wm King of Brighton (1786-1865) in his paper, *The Co-operator* (1828-30), gave a much more coherent account of co-operative aspirations and ideas. The Rochdale Pioneers, who opened their store in Toad Lane in 1844, harnessed the co-operative idea to practicalities. By basing C. on consumer effort, their society and the many which followed its ideas had much wider appeal. Basic principles of the Rochdale Pioneers have been defined as: (1) open membership; (2) democratic control—one man one vote; (3) payment of limited interest on capital; (4) distribution of surplus in proportion to transactions. Operation of these principles marks off co-operatives from other types of enterprise. A co-operative is a voluntary institution. In it capital is subservient to human interests in the society. Each member of a society is a shareholder but no member under present law may hold more than £500 share capital. Profit is eliminated in the ordinary sense of the term. The society exists to serve its members, and membership is not exclusive.

Co-operatives also aim at resisting consumer exploitation by observing fair standards themselves and supporting legislation likely to safeguard the consumer. There is no special code of co-operative law in Britain. Societies are registered under the Industrial and Provident Societies Acts, 1893-1954, which do not apply exclusively to co-operative societies. Use of the word 'co-operative' is restricted under the Companies Act, 1948, and Prevention of Frauds Act, 1939.

In Britain the strongest element of the Co-operative Movement is the consumer retail society, of which there are 947 with some 12,070,600 members. Sales amounted to £908 million in 1956 of which £680 million was on foodstuffs. Societies operate 27,467 shops including 529 departmental stores. The number of

societies has been declining since the beginning of the century through amalgamations. Brit. consumer co-operatives are the largest in the world—the London society has some 1,238,700 members; membership of 14 societies exceeds 100,000. No new societies have been started in recent years, development taking place through existing societies, the Co-operative Wholesale Society (C.W.S.) and the Scottish Co-operative Wholesale Society opening retail branches.

Dividends on purchases amounted to £44,500,000 (equivalent to 1s. 0½d. per £ of sales) and are paid out in cash or transferred to members' shareholding accounts. Share capital in retail societies was £246,071,413, loan capital £46,720,676, and reserves £33,538,190. Surplus capital is usually invested in the wholesale societies. Retail societies have to be regarded as popular banks as well as trading institutions; they are often agents of the C.W.S. bank and have their own small savings banks. Originally opposed to credit trading, societies today offer hire purchase and other credit facilities for non-food purchases. The pay roll of retail societies is 286,507 workers. Local federations of consumer societies provide milk, baking, laundry, and other services; the turnover is £29,277,542.

The Co-operative Wholesale Society, Manchester, is the national trading and manufacturing organisation of co-operatives in England and Wales. Estab. in 1863, its trade today amounts to £444 million. 200 factories are operated, mainly to prepare consumer goods. Turnover was £444 million; productions, £112 million; pay roll, 52,000. A similar organisation was set up in Scotland in 1868, the Scottish Co-operative Wholesale Society (or S.C.W.S.), Glasgow, to serve co-operatives in Scotland; turnover was £86 million; productions, £27 million; pay roll, 13,742. Both organisations are engaged in banking operations, the C.W.S. since 1872, the S.C.W.S. entering the business in 1949. The C.W.S. and S.C.W.S. are partners in a joint undertaking for tea, cocoa, and coffee which has estates in S. India and Ceylon. The Co-operative Insurance Society—premium income £40 million—is also a joint undertaking, and other important national societies are the Co-operative Permanent Building Society and Co-operative Press Ltd.

About 32 co-operative co-partnership societies are engaged in clothing, footwear, and printing trades, etc. Here workers are members and shareholders, and have a say in management and share profits as workers. Nowadays capital is supplied by retail societies whose needs the productive societies supply (turnover is £5½ million, pay roll, 4265). Productives have their own separate Co-operative Productive Federation at Leicester.

Co-operative Union (1869) is the association of retail societies in the Brit. Is.; H.Q. are at Hoiyoake House, Manchester. Membership consists of retail societies, the wholesale societies, the Co-operative Insurance Society, the Co-operative

Permanent Building Society, and the Co-operative Productive Federation. The Union does not engage in trade but is an advisory, representative, and educational body. Its ann. meeting is the Co-operative Congress and between times it is controlled by a Central Executive.

Co-operatives were pioneers of adult education, and larger retail societies still have education departments. The Co-operative Union has estab. a residential college at Stanford Hall, Loughborough, where Brit. co-operators and overseas students are trained. The National Co-operative Education Association was set up in 1948. Guilds have been estab. with societies for men and women to enable fuller discussion of co-operative and public affairs. The Women's Guild has played a conspicuous part in safeguarding women's interests since its foundation in 1883.

The Co-operative Party was estab. in 1917 primarily to defend the interests of co-operative societies in Parliament and bring co-operative ideas to influence political policy. The Party is closely linked with the Co-operative Union. Its relations with the Labour party are governed by an agreement reached in 1946. 21 Co-op-Labour M.P.s sit in the Commons. Co-operative M.P.s normally follow the Labour Whip. The Co-operative Union is a member of the National Council of Labour along with the U.C. and the Labour party.

Agric. produce marketing and service societies number 235 (198,000 members) in England; 86 (49,021 members) in Wales; 71 (36,051 members) in Scotland; 35 (8873 members) in Ulster; 302 (98,868 members) in the Irish Rep. A federation of agric. co-operatives in Great Britain and Ireland was estab. in 1949. National Agricultural Organisation Societies operate for each country, whilst England has recently estab. its Agricultural Co-operative Central Association, London. There are 49 (2315 members) fisheries co-operatives in England with an Advisory Organisation Society in London. 150 self-build housing societies have been set up in recent years attached to the National Federation of Housing Societies.

The International Co-operative Alliance (I.C.A.) (1895) has H.Q. in London, and is a category A non-government member of the United Nations Economic and Social Council. An International Congress is held every three years. The I.C.A. collects and disseminates information on co-operatives, and formulates international co-operative policy. Thirty-nine nations including Britain, France, and other European countries are members, as well as the movements of the U.S.A., Canada, U.S.S.R., and Commonwealth ters. such as Malaya and Ghana. I.C.A. membership consists of 42,400 consumer societies with 62,242,260 members; 259,624 credit societies with 34,163,216 members; 53,501 agric. societies with 15,390,149 members; 10,429 workers' productive societies, 6016 building societies, 5323 miscellaneous societies—in all 377,293 societies with 120,312,647 members. The

International Labour Office, Geneva, has a Co-operative Division.

Substantial development of co-operatives in the dependent territories of the British Commonwealth has occurred since 1946. Membership of these societies operating in twenty-five territories numbers 1,168,581; credit societies total 4330, marketing 3533 with turnover of £51 million, consumer societies 787; a total of 9440 societies. Developments are notable in Cyprus, Nigeria, Ghana, and Malaya. The Colonial Secretary appointed a Co-operative Adviser in 1946. Great importance is attached to co-operatives in the Colonies on account of the training they provide in elementary democratic association, self-reliance, and in understanding basic economic problems. At this stage in most territories there is usually a Co-operative Dept or Officer not only to register societies but also to promote their development, and advise them where necessary. One of the first problems of Colonial co-operatives is to relieve populations from indebtedness through credit societies. Agric. marketing societies follow. These societies had a turnover of £51 million in 1955. A large portion of coffee and cocoa produced in African territories is handled by co-operatives. The consumer societies develop as expendable income of people increases. Handicraft, school, maternity services, and fishery societies are among the activities of the miscellaneous group. In a great many dependencies national or regional co-operative unions have been established, which in time should take over most of the functions performed by the Co-operative Depts, making the movements completely autonomous.

In the Irish Republic, there is a revival of interest in C. and a National Council has been set up in Dublin, where there are agric. organisation and wholesale societies. Co-operative creameries number 200 with turnover of over £30 million. Belfast has a strong consumer society.

Friedrich W. Raiffeisen (1818-88) of Heddendorf, Germany, is regarded as the pioneer of the agric. credit society. Herman Schulze-Delitzsch (1808-83), a German economist, conceived the idea of urban credit societies for the workers. It would be difficult to identify any particular group or individuals with the start of agric. co-operatives. Edward Owen Greening (1863-1922) in England and Sir Horace Plunkett (1854-1932) in Ireland did much to show what co-operatives could do for the countryside. Technical developments, better transport, and the emergence of large centres of population led farmers in Europe and elsewhere to create co-operative organisations to assist them in meeting changed conditions. Most European countries have both urban and agric. co-operative movements. Consumer societies are particularly strong in Finland and Sweden. Denmark's co-operative marketing organisations are world famous. Housing co-operatives in France, the Netherlands, and Sweden are important. Co-operatives in countries beyond the Iron Curtain function but are

under direction of the political regime. This applies also in the case of the U.S.S.R. where the co-operatives have 32,000,000 members. Societies only function in the rural areas. Spain and Portugal also have co-operatives operating under state control. One of the most interesting centres of co-operative development today is Israel, where almost every type of co-operative is to be found. Co-operative communities (*Kibbutz* and *Moshav*) give reality to the ideas of the co-operative pioneers.

Both in the U.S.A. and Canada C. is mainly a rural movement—credit, marketing, and supply. Turnover of Canadian marketing, purchasing, and service co-operatives amounted to \$986 million in 1954. The state of Saskatchewan has a Co-operative Dept. Consumer societies are not strong in the cities of N. America. St Francis Xavier Univ., Nova Scotia, has centred attention on co-operatives as a Christian way of achieving social justice.

Workers' productive co-operatives are to be noted in Mexico, where several daily newspapers are published by such societies. There, also, are to be found the *egidos* communities. In British colonies and other Caribbean territories, co-operatives are operating and may have a big future. They are establishing their own federation. Argentine, Brazil, Venezuela, Colombia, Peru all have co-operative institutions, but these have not so far exercised much influence on the national economies.

Members of the Indian Civil Service closely studied European C. at the beginning of the century and introduced these ideas into India. From India, C. has spread to Burma and Ceylon and to different parts of Asia. The new constitution of India lays claim that its purpose is the establishment of a Co-operative Commonwealth. Whilst C. is generally developed in India, there is scope for its making a much fuller impact on the economy, and this may come about as a result of recent planning.

China has industrial, agric., and supply co-operatives—98,000 retail shops are operated. Japan has strong credit, agric., and fishery co-operatives. Dr Kagawa has lent his support to the co-operatives.

S. Africa, Australia, and New Zealand have agric. co-operatives for supply and marketing. Co-operatives in their various forms have proved amazingly adaptable to conditions all over the world. They provide an alternative to nationalisation as well as to capitalist enterprise. By providing opportunities for democracy to extend into trade and industry and by giving practical expression to the idea of equity they have won universal confidence. Their potential is enormous, and more recently thought has been given to states organising on co-operative lines to control supplies and services on a mutual basis, e.g. international waterways. See AGRICULTURAL CREDIT; BUILDING SOCIETY; CO-PARTNERSHIP; FISHERIES; OWEN, ROBERT. See also G. D. H. Cole, *Century of Co-operation*,

1944; M. Digby, *World Co-operative Movement*, 1948, and *Agricultural Co-operation in Great Britain*, 1949; W. K. H. Campbell, *Practical Co-operation in Asia and Africa*, 1951; E. M. Hough, *The Co-operative Movement in India*, 1953; P. Greer, *Co-operatives: The British Achievement*, 1954; J. Bailey, *British Co-operative Movement*, 1955; International Labour Organisation, *The Co-operative Movement and Present-Day Problems* (Geneva), 1955; *Report of the Chief Registrar of Friendly Societies, Part 3—Industrial and Provident Societies* (Her Majesty's Stationery Office, annually).

Co-operative Societies, see CO-OPERATION.

Cooper's Creek, or **Barcoo River**, rises in Queensland, Australia, and flows S. for some distance, then takes a westerly turn and flows by means of a delta into Lake Eyre. In the dry season it usually dries up, but in the rainy season there is a series of detached pools and lagoons.

Cooper's Hill, ridge on the borders of Surrey and Berkshire, England. Here stands the Commonwealth Air Forces Memorial, designed by Sir Edward Maufe, and opened by Queen Elizabeth II in Oct. 1953. C. H. is the scene of Sir John Denham's best-known poem, pub. in 1642.

Cooperstown, vil. in New York state, co. seat of Otsego co., made famous by Fenimore Cooper (see his *Correspondence*, ed. by his grandson).

Co-ordinates of a point are the lengths of two adjacent sides of a parallelogram formed by drawing straight lines from the point parallel to two fixed intersecting straight lines called the axes. The use of C. forms a branch of mathematics called *Analytical Geometry*, which consists of the application of the principles of algebra to geometry. See GEOMETRY, *Analytical*.

Co-ordination, insulation, in electric supply networks, the design of insulation and protective gear with respect to breakdown strength such that the strength at any point is proportional to the importance of a breakdown at that point, as measured by the extent and magnitude of interruption of supply that would arise from such a breakdown. In any house installation, the insulation and the fuses should be so adjusted that a fault in any group blows the fuse for that group before the insulation is damaged or a main fuse is blown. In an interconnected system, a fault in any section should isolate that section before it affects other sections. In case of lightning disturbances, the protective gap should flash over before dangerous voltages arise in the lines.

Coorg, area in India lying between Mysore State and W. coast dists. of S. Kanara and Malabar in Madras State. Formerly a chief commissioner's state, C. is now a separate state administered direct by the Central Gov. of India. It consists mainly of forests and hills, among which the R. Kaveri rises. The prin. tn is Merikara. C. was involved in the fighting between the Brit. and Hyder Ali (1773) and Tipu Sultan (1782-3), whom the people resisted gallantly. In 1834

the people requested the Brit. to remove their hereditary rajah and to assume control.

Coornhert, Dirk Volckertsen (1522-90), Dutch scholar and copper engraver, b. Amsterdam. In 1564 he became tn clerk of Haarlem. Taking part in the struggle against Sp. rule in 1566, he drew up the manifesto of William of Orange and was imprisoned at The Hague by the Spaniards in 1568, but escaped to Cleves, where he found a living as an engraver. Recalled in 1572 he became secretary of Holland in the service of William of Orange for a short time, but his dislike of war drove him back to Cleves, where William continued to employ his services. His chief prose work is *Zedekunst, dat is wellevenskunst*, 1586. He trans. into Dutch from Cicero, Seneca, Boethius, the *Odyssey*, and Boccaccio; but his Dutch version of the N.T. from the Lat. of Erasmus was never completed. He is credited with great influence in establishing the literary language of Holland, and as an opponent of Calvin he was one of the first to fight for religious tolerance.

Coorong, The, arm of salt shallow water near the mouth of the R. Murray, S. Australia; it is about 100 m. long, and 2 m. broad, and is separated from Encounter Bay (36° S., 139° E.) by a narrow isthmus.

Coot, water-fowl (*Fulica atra*), slatey below, sooty black above, with a to bill joining a white patch on the forehead. It has 4 toes, not fully webbed. In coloration the sexes are alike, but the male is slightly the larger. They are widely distributed on inland waters in the Brit. Isles, Europe, N. Africa, Asia, and Australia. Their nest is built on water-plants and is made of dry rushes. The eggs are stone colour with brown specks, and are about 2 in. long.

Cootamundra, tn in Harden co., New S. Wales. Wheat of an excellent quality is grown in the neighbourhood. Pop. 5820.

Cootie, Sir Eyre (1726-83), soldier, b. in the co. of Limerick. He entered the army at an early age, and went to India in 1754. While there he urged Clive to fight the battle of Plassey, defeated the Fr. at Wandiwash, and by his capture of Pondicherry in 1761 completely overthrew the Fr. in India. On his return to England he was knighted. In 1779 he returned to India as commander-in-chief; he defeated Hyder Ali at Porto Novo in 1781, and so saved Madras for the second time. See life by H. C. Wyllie, 1922; E. W. Sheppard, *Cootie Bahadur*, 1956.

Cooteshill, tn of co. Cavan, Rep. of Ireland, on the R. Annalee. Pop. 1500.

Copaiba, or **Copaiva**, oleo-resin, its two chief constituents being resin and volatile oil. This substance is a secretion of trees which are natives of the W. Indies and Amazon valley. Each tree yields a large quantity of the oleo-resin, so much sometimes that it bursts the trunk with a loud noise. It is characterised by an aromatic odour, which is not at all unpleasant, and by a bitter taste. C. has been used as a urinary antiseptic.

Copaia, or **Topellias**, formerly a lake of Boeotia in Greece. Area 135 sq. in. The lake, enclosed by mts and a mere marsh in summer, was drained in 1886 by tunnels connecting it with the Euripus through two other lakes. The reclaimed land produces cotton, grain, and good pasturage.

Copal, resinous substance obtained from trees and used in making varnishes. It is usually of a light yellowish colour, generally transparent, is found in pieces which are round in shape, and is brittle. It is partially soluble in oil of turpentine, but to be entirely so it has first to be heated, which process it undergoes before being dissolved in this oil or linseed oil for producing varnishes and lacquers. It is found in the E. Indies, S. America, and Africa. The variety known as Fossil C., the product of trees long since dead, is found in the regions around Zanzibar where it is dug up in the form of pebbles or nuggets.

Copalchi Bark, obtained from a shrub of Mexico and Central America, the *Croton pseudo-China* or *niveus* (Euphorbiaceae), allied to the cinchona. It is used as a febrifuge, as a substitute for quinine.

Copán, tn of C. dept, Honduras, on the C. River in Central America. Remarkable ruins, including a temple, truncated pyramids, monoliths with carving and hieroglyphics, and the ceremonial G Stair, stand near by, testifying to magnificence of the Mayan Old Empire of C. C. is a tourist centre in a mountainous dist. Pop. 1000.

Co-partners (Co-partitioners) (1). at common law female co-owners claiming title by descent to an estate, or inheritance in land, or co-owners of either sex claiming title *through females*: less frequently (2) by custom tenants in gavelkind (see GAVELKIND). As to (1), if a man dies intestate, leaving females as his next heirs, these take his freeholds of inheritance equally, for the rule of primogeniture does not, generally speaking, apply to females. This form of tenure has now been abolished, though a knowledge of its incidents and implications is required by lawyers in tracing title.

Co-partnership in industry is commonly defined as the endeavour to give some formal and practical expression to the underlying partnership between Labour, Capital, and Management in all industrial enterprises. It often finds this expression in some measure of profit-sharing (q.v.), joint consultation, and employee shareholding. These devices are not, however, synonymous with C., because the loyalty and co-operation of employees is not something that can be bought by management; they have to be earned. In creating a spirit of C. within an enterprise a management will seek to demonstrate that its motives are not entirely selfish, hence profit-sharing; that ownership is not the monopoly of any group within the society, hence employee shareholding; and that responsibility, in the different degrees appropriate to their differing functions, attaches to all the members of

the group involved in the enterprise, hence joint consultation. The wide scope of C. makes the keeping of statistics difficult. The Ministry of Labour and National Service conducted an enquiry during 1955, on the basis of definitions rather less rigid than those used in earlier enquiries, and found (*Ministry of Labour Gazette*, May 1956) that 421 enterprises (including 111 co-operative societies) employing 611,713 persons had C. arrangements in which 389,433 employees participated. The Report also mentioned a further 130 firms, with 163,331 employees (132,671 participating), with arrangements that escaped the definitions adopted for the compilation of the statistics but which were 'broadly of a profit-sharing character.' Comparisons with the pre-1938 reports are vitiated by the changes in definitions, but the chief alteration occurred in the gas industry where 57 C.s came to an end as a consequence of nationalisation in 1949. The Ministry's figures were based on a voluntary return in response to enquiries addressed to some 1800 enterprises, and are therefore not complete; nor was the list a representative example. The chief industries in which C.s occur are in the chemical and allied trades with 25 enterprises and 105,000 participants; engineering, shipbuilding, and electrical goods, 57 with 39,000; vehicles, 8 with 36,000; treatment of non-metallic minerals, products other than coal, 17 with 30,000; and food, drink, and tobacco, 22 enterprises with 29,000 participants. All the industrial groupings used by the Ministry of Labour for their statistics show some examples of C. (In the above figures no account is taken of the 111 co-operative societies which have profit-sharing.) As the importance of ownership declines and management becomes a profession, the element of partnership in industrial enterprises is more in evidence, and trade unions reflect this change by their increasing interest in such questions as productivity. In response to the same trends Industrial C. (or as it was earlier termed, before the word took on a political significance, Labour C.) today lays increasing emphasis upon sharing information, and explaining industrial decisions. The Industrial C. Association (formerly the Labour C. Association) was founded in 1884 as an industrial society, to provide for industry the services of a clearing-house for information upon practical experience of C. and publishes in the quarterly *Jour. C. news* of developments in this field (Industrial Co-partnership Association, 36, Victoria Street, London, S.W.1).

Cope, Sir Arthur Stockdale (1857-1940), painter, chiefly of portraits, but also of landscapes; son of Charles West C., R.A. (q.v.). Educ. at Norwich and Wiesbaden, studied art at Royal Academy schools. From 1876 he contributed in the Royal Academy, and painted the portraits of King Edward VII, the last Ger. emperor, the Archbishop of Canterbury, Lord Kitchener, the Duke of Cambridge, King George V, the Prince of Wales, and

other celebrated people. His 'Some Sea Officers of the Great War' is in the National Portrait Gallery. He became R.A. in 1910; and was made K.C.V.O., 1927.

Cope, Charles West (1811-90), painter. He studied at the Royal Academy and in Europe, obtained a prize of £300 in a competition for the decoration of the Houses of Parliament, 1844, and executed sev. frescoes for the House of Lords. He was elected R.A. in 1848, and produced many wall-paintings and other works of an illustrative and historical nature.

Cope, Sir John (d. 1780), general. The date of his birth is uncertain, but he was apparently knighted before 1742, the year in which he was sent with an army to aid the Queen of Hungary. He is chiefly memorable for his defeat at Prestonpans (21 Sept. 1745) by Prince Charles, the Young Pretender. See Sir R. Cadell, *Sir John Cope and the Rebellion of 1745*.



COPE

Cope (Lat. *cappa*), vestment worn by priests in the W. Church at processions and vespers; in the Gk Church by bishops and archimandrites only; and in the Armenian Church by the celebrant at mass. In the Church of England the C. was authorized by the 24th canon of 1603 for the celebrant at Holy Communion in cathedrals and collegiate churches. It is a cloak with a vestigial hood, reaching to the ground, and fastened at the neck with a clasp or morse, often embroidered.

Cope, see CASTING.

Copeck, see KOPEK.

Copenhagen (Dan. København), cap. of Denmark, a flourishing city and seaport, which contains more than $\frac{1}{4}$ of the whole pop. of the country. Its name signifies 'Merchants' Haven'. This city is situated in the Sound and covers part of 2 is. The greater part of C. lies on the E. coast of the is. of Zealand, whilst the smaller part is on the is. of Amager, and occupies the N. The 2 is. are connected by the bridges Langebro and Knippelsbro. The portion of C. on the is. of Amager is called Christianshavn. There are many outlying suburbs of C. in the is. of Zealand, principally Holte, Klampenborg, Lyngby, Glostrup, Hvidovre, Rødovre, and Herlev. The outlying suburb in the is. of Amager is Kastrup with N. Europe's biggest airport. The prin. public square of C. is Kongens Nytorv, commanding a central position and facing the entrances to 12 streets. There is a colossal statue of Christian V in the centre of the square. Two important buildings, the palace of Charlottenborg and the Royal Theatre (national theatre), face the square. Two statues of the great national writers, Holberg and Oehlenschläger, stand in front of the theatre, whilst inside among other sculptures is the relief figure of 'Ophelia' sculptured by Mrs Sarah Bernhardt. Strøget is the centre of the most fashionable shops, and Bredgade the main street of the court and various embassies. A portion of the old tn of C. is cut off by artificial waterways and is called Slotsholmen or Castle Is. Here are many important buildings, such as Christiansborg Palace, which is the seat of the gov. and the Folketing (Parliament), the royal library (containing 950,000 vols and 35,000 MSS.) and the Thorvaldsen Museum—here, in an open court, lies the tomb of the famous sculptor, and here are some of the finest examples of his statuary. The cathedral church, Vor Frue Kirke (Church of Our Lady), lies in the heart of C., NW. of Slotsholmen, and is adorned with works of sculpture by Thorvaldsen, including the celebrated 'Twelve Apostles.' Not far from the church lies the univ., founded in 1479. It is a State institution, frequented by 5000 students, and possessing a valuable library with free admission to the reading room for everybody. It contains 800,000 vols. Other useful and important institutions and buildings are Denmark's Technical College, the Veterinary and Agric. College, Serum Institute, Seed-controlling Institute, Institute of Technology, College of Commerce, College of Dentistry, State Training College for Teachers, Finsen Medical Light Institute, Insuline Laboratory, botanical garden, National Museum, Ny Carlsberg Glyptothek or gallery of sculpture, sev. art galleries, the Exchange, National Bank, the Amalienborg Palace, which is the royal residence, the Rosenborg Palace, Frederiksberg Palace, and other palaces. The zoological gardens are the largest in Scandinavia. The free port is the centre of the transit trade of the Baltic

and is connected by steamship lines with every port on the globe. It is the centre of the air traffic of N. Europe. The broadcasting system is operated by the state. Shipbuilding is carried on, and there are extensive porcelain works. The hist. of C. dates back to about the middle of the 12th cent., when Bishop Absalon built a castle as a defence against the pirates. It was only a small fishing vil. then; in 1254 it obtained the privileges of a tn and in 1443 it was made the cap. of Denmark. The tn was successfully defended against the Swedes, 1658-60. Much of the old tn was destroyed by fires in 1728 and 1795. During the Napoleonic

fresh and salt water. The free-swimming forms have always a large head, and the body ends in a caudal fork. Some of the species are phosphorescent. *Cyclops* is a well-known fresh-water genus, and *Lonchidium* is parasitic on the gills of sharks. C. are the commonest Crustaceans in the sea; some of them are planktonic. Altogether there are about 8000 species of C.

Copernicus, Nicolaus (1473-1543), founder of modern astronomy, b. Thorn, in E. Prussia, then a part of Poland. After the death of his father in 1483 Nicolaus was practically adopted by his uncle, Lucas Watzelrode, afterwards bishop of



Danish Tourist Bureau

COPENHAGEN—KONGENS NYTORV

wars, C. was attacked by the Eng. in 1801 and 1807. The opening of the free port in 1894 made C. one of the most important ports in the Baltic Sea. In 1940 the Gers. invaded Denmark, troops being landed at C. and other places from warships and transports on 9 April. C. was liberated from the Gers. in May 1945, the first Allied troops to enter freed Denmark being a company of a S. Lancashire parachute battalion. Pop. 753,360 (with suburbs, 1,227,100).

Copenhagen Fields, dist. in the bor. of Islington, N. London, which in old days was often the scene of huge public demonstrations. Thus on 26 Oct. 1796, and again on 21 April 1834, great meetings were held there in favour of trade unionism. The Caledonian Market (q.v.) was built on the fields.

Cöpenick, see **KÖPENICK**.

Copepoda (Gk *kōpē*, oar, *pous*, foot), order of Crustaceans which receive their name from the fact that typically they bear six pairs of swimming feet arranged down the body rather like the oars of a boat. They are to be found in both

Ermland. In 1491 he matriculated at the univ. of Cracow, and gave himself up principally to the study of astronomy under Brudzewski. He soon abandoned his early idea of taking holy orders, and went as Polish student to the univ. of Bologna, where he studied canon law. In 1500 he himself lectured on mathematics at Rome with great success. After a short visit to his native land he went in the next year to Padua, where he studied medicine and philosophy. In 1505 he finally left Italy, and went to spend 6 years as his uncle's physician at the castle of Hellsberg. On the death of Lucas in 1512 C. went to Frauenburg, where he had been nominated canon of the cathedral in 1497. Though he never took orders, his activities in this capacity were multifarious, and all his knowledge was freely laid at the disposal of the diocese. However, till the end of his life astronomy was his favourite study; and in spite of his busy life he found time to perfect at Frauenburg the system of which he had already laid the foundation at Hellsberg. His great theory was broached in 1543 in the *De Revolutionibus*

Orbium Coelestium, Libri VI, pub. at Nuremberg, and dedicated to Pope Paul III. This work demonstrates the theory, already hinted at by the Pythagorean philosophers, that the sun is the centre of the planetary system, and that the earth and the planets revolve round it. Kepler, Galileo, and others developed the system, until it was completed by Newton. According to Prof. Herbert Dingle the course of C.'s thought has been traced out by the Polish scholar, Birkenmajer, from marginal notes and amendments on the MS. of *De Revolutionibus* itself, and where observational facts failed C. supplied them himself, with an instrument of his



NICOLAUS COPERNICUS

Engraving after a picture in the possession of the Royal Society, presented 1776.

own making, though he was essentially a thinker rather than an observer. C. had been at work for more than 30 years before at last agreeing to the pub. of his work. This was not, as is often supposed, because he feared that his work would be condemned as heretical; it was rather that the idea on which his system depended appeared at that time so incredible that only those with an intimate knowledge of astronomy could be expected to entertain it for one moment. He was at last persuaded to publish his work by the earnest solicitations of many friends, including Schönberg, cardinal bishop of Capua, and Tiedemann Giese, bishop of Culm, as well as his young pupil Rheticus, who obtained permission to issue an account of the new system under the title *Narratio Prima de Libris Revolutionum*. This was the first printed work on the Copernician theory, and the resulting ridicule being less than C. had feared, he consented to the pub. of his own *magnum opus*. The Pope, Paul III, accepted the dedication of the work to himself. *De Revolutionibus* represents a complete reformation of astronomy; the discovery

of the true form of the planetary orbits by Kepler, and the conception of universal

immediate effects, however, in the sphere of philosophy and theology were not conspicuous. Generally speaking, the reaction was favourable in Rom. Catholic circles but contemptuously antagonistic among the Lutheran reformers. There was no question of persecution or suppression, and it was only when new philosophies arose that the trouble began. When the notion of an infinite universe was advanced by Bruno it was realised that the work of C. had removed the previously fatal objection to it; and when the removal of Bruno was followed by the discoveries and irrefutable polemics of Galileo, the time had come to deal with the evil at its source. *De Revolutionibus* was denounced by Luther and Melancthon as contrary to the truth—an opinion held by the popes from 1616 to 1757, with the result that it was placed on the Index and not removed from it until 1835. In the almost complete destruction of national monuments in Warsaw during the Second World War, the statue of C. by Thorwaldsen was spared. The inscription 'Nicolaus Copernicus: his Fellow Countrymen' had been changed to 'Nicolaus Copernicus: the German Nation,' on the assumption that C. could be regarded as being of Ger. descent. But this disfigurement was removed with the restoration of the memorial to the Polish people. (Prof. Herbert Dingle, 'Copernicus, 1473-1543,' *Spectator*, 21 May 1943.) See L. Prowe, *Nicolaus Copernicus: Leben und Urkunden*, 1883-4; A. Armitage, *Sun, Stand Thou Still: the Life of Copernicus*, 1948.

Copertino, It. tn, in Apulia (q.v.), 9 m. SW. of Lecce (q.v.). Pop. 8000.

Copford, vil. of Essex, England, some 5 m. from Colchester, with a par. church dating from the 12th cent. The wall paintings were completed c. 1150. 'The Raising of Jairus's Daughter' is the only one remaining untouched by 19th-cent. restorers.

Coplapó: 1. Riv. in Atacama prov., Chile, c. 110 m. long, flowing W. to join the Pacific 18 m. SSW. of Caldera. The irrigation of the surrounding country and the water supply of the tn depend wholly on this riv. It is popularly regarded as the S. limit of the Atacama Desert.

2. Tn, cap. of the prov. of Atacama, Chile, 1215 ft above the sea, on C. R. 190 m. SSW. of La Serena. It is a trading centre and the prin. centre of Chilean mining, especially silver and copper, with some gold. The new national smelter at Paipote contributes to an economic revival of the dist. Pop. 21,000.

Copland, Aaron (1900-), Amer. composer, b. Brooklyn; studied with Rubin Goldmark in New York and Nadia Boulanger in Paris. Various prizes enabled him to devote himself to composition independently of any official appointment, apart from a good deal of lecturing, and he established himself as

perhaps the leading and certainly the most versatile Amer. composer of his generation. His modern and daring style is a compound of jazz and native Amer. elements and many advanced technical procedures. His numerous works include the opera *The Tender Land*; 5 ballets, including *Billy the Kid*; incidental and film music; unaccompanied choruses; 3 symphonies, and other orchestral works; piano and clarinet concertos, and symphony for organ and orchestra; chamber and piano music, and songs.

Copland, Sir Douglas Berry (1894-), economist, since 1953 Australian high commissioner in Canada, b. Timaru, New Zealand. C. was educ. Canterbury College, appointed prof. of economics, univ. of Tasmania, 1920-4; prof. of commerce, Melbourne Univ., 1924-44; prof. of economics, Melbourne Univ., 1944-5. He was Australian Minister to China 1946-8, vice-chancellor, Australian National Univ. 1948-53. Not only has C. achieved distinction in his academic career, but as economic adviser to the Australian Gov. in various capacities he has been influential in the shaping of economic policy. He has served on many governmental committees in Australia and New Zealand; he was chairman of the committee responsible for initiating the Premiers' Plan at the Loan Council meeting, 1931, commonwealth prices commissioner 1931-45, and economic consultant to the Minister 1941-5. From 1925 to 1945 was editor of *Economic Record*, and numerous pubs. include: *Australia in the World Crisis, 1929-32*, 1934; *The Australian Economy*, 1931 (6th ed. 1946); *The Road to High Employment*, 1945; *Back to Earth in Economics: Australia, 1948*, 1948; *Inflation and Expansion*, 1951.

Copley, John Singleton (1735-1815), Amer. historical and portrait painter, b. Boston, Massachusetts. He studied at Rome, 1774, and came to England; he was made Academician in 1783. He was the father of Baron Lyndhurst (q.v.). His best-known paintings are: 'Death of Chatham' and 'Death of Major Pierson,' and the latter is one of the minor classics of his period in its sense of the heroic, its vigour of composition, and technical skill. His group of the Royal Princesses at Buckingham Palace also reveals a painter of outstanding ability.

Coplin, William Michael Late (1864-1928), Amer. physician, b. Clarksburg, W. Virginia. Prof. of Pathology, Jefferson Medical College, for nearly 30 years from 1896. Director of the Dept. of Public Health and Charities, Philadelphia, 1905-7. Medical director, Jefferson Hospital, 1907-12. Author of *Text-Book of Practical Hygiene*, and of a *Manual of Pathology, including Bacteriology, the Technique of Post-mortems, and Methods of Pathologic Research* (5th ed., rewritten and enlarged), 1912.

Coppard, Alfred Edward (1878-1957), short story writer and poet, b. Folkestone. Leaving school at 9, he tried various occupations before producing his first book, *Adam and Eve and Pinch Me* in 1921. Other collections of his stories are

The Black Dog, 1923; *Fishmongers' Fiddle*, 1925; *The Field of Mustard*, 1926; *Silver Circus*, 1928; *The Gollan*, 1929; *Dunky Pillow*, 1933; *Ninepenny Flute*, 1937; *Tapster's Tapestry*, 1939; *Ugly Anna*, 1944; *Fearful Pleasures*, 1946; and *The Dark-Eyed Lady*, 1947. Vols. of poetry include *Hips and Haws*, 1922, *Pelagia*, 1926, and *Yokohama Garland*, 1928; *Collected Poems* appeared in 1928. *It's Me, Oh Lord*, 1957, is the first part of an autobiography.

Copparo, It. tn. in Emilia-Romagna (q.v.), 11 m. N.E. of Ferrara (q.v.). It has silk industries. Pop. (com.) 24,500.

Coppée, François Edouard (1842-1908), Fr. man of letters, b. Paris. At first a clerk in the Ministry of War and for some time dramatic critic to *La Patrie*, he acted from 1878 to 1884 as archivist of the Comédie Française, giving up this position on his election to the Academy. In his numerous collections of poetry, including *Intimités*, *poèmes modernes*, 1867-9, *Olivier*, 1875, his only long poem, and *Poèmes et récits*, 1886, may be found many delightful illustrations of his lyrical gifts, and especially of his skill in writing Parisian elegies and idylls. Of his plays, *Le Passant*, 1869, met with a hearty reception; but *Le luthier de Crémone*, 1876, *Les Jacobites*, 1885, and *Pour la couronne* (1895) are his more ambitious metricalamas. Though banality of thought and sentiment not infrequently detract from the literary merits of his work, his simple, jealous patriotism, his aloofness from the prevalent style of scientific dissection, and the reality of his sympathy with the sufferings of the poor, are often moving. See L. de Meur, *La vie et l'œuvre de F. Coppée*, 1933.

Copper (symbol Cu, atomic weight 63.57, atomic number 29) is found as the metal in various parts of the world, chiefly in the neighbourhood of Lake Superior, but also in other parts of America, Cornwall, Siberia, and the Ural Mts. It is also found in combination with other elements, being an abundant element widely distributed. The name is derived from *aes Cyprium* or bronze of Cyprus, the Romans having obtained most of their metal from that is. In the form of cuprous oxide (Cu₂O) it is found in Cornwall, S. America, and Australia, and is known as *cuprite* or *ruby ore*. Then again, the mineral *C. glance* is really *C. sulphide* (Cu₂S), while it is also found associated with sulphide of iron in the mineral *C. pyrites* (Cu₂S, FeS₂), and again in the mineral *purple C. ore* (3Cu₂S, Fe₃S₄). The basic carbonate of the metal is also found in the minerals *malachite* (CuCO₃.Cu(OH)₂). These are the minerals chiefly used for the extraction of C. on the large scale; but silicates, phosphate arsenates, and the oxychlorides are also known, and by modern methods the metal may sometimes be extracted from these, especially the silicates.

Methods of Extraction: (1) *Reducing process.*—From those ores which contain no sulphur, such as the carbonates and oxides, the ore may be smelted down in a blast furnace with coal or coke, when the

ore is reduced; C. being left and carbon monoxide formed ($\text{Cu}_2\text{O} + \text{C} = 2\text{Cu} + \text{CO}$).

(2) *English method.*—With mixed ores containing sulphides the process consists of 6 stages: (a) The ores (containing on an average 30 per cent of iron and 13 per cent of C., together with sulphur and silica) are calcined in a reverberatory furnace, some of the sulphur passing off as sulphur dioxide, and the metals becoming partly oxidised. (b) The calcined ore is fused, and the C. oxides react on some of the ferrous sulphide, forming cuprous sulphide and ferrous oxide (because C. possesses a greater affinity for sulphur and a smaller affinity for oxygen than the iron). This oxide of iron then unites with the silica, either present in the ore or added, to form a fusible slag, which is run off. That which remains is known as coarse metal, and consists of a mixture of ferrous and cuprous sulphides, containing about 30 per cent of C. This is allowed to flow into water, causing it to solidify in a granular form. (c) The coarse metal is again calcined, with the same effect as in (a), some of the sulphur passing off and the metals becoming oxidised. (d) This is now fused with refinery slag, and produces nearly pure cuprous sulphide, most of the iron passing into the slag, then known as metal slag, which is run off. The remainder after this process is known as fine metal, or white metal, and contains, perhaps, 75 per cent of C. (e) This white metal is the roasted in a reverberatory furnace. Some of the cuprous sulphide is oxidised into cuprous oxide, and this reacts on the cuprous sulphide left as the temp. rises, forming C. ($2\text{Cu}_2\text{O} + \text{Cu}_2\text{S} = 6\text{Cu} + \text{SO}_2$), while any remaining ferrous sulphide is turned into oxide. The metallic C. obtained is now known as blister C. (f) This is then refined by being melted on a hearth in an oxidising atmosphere. The impurities present oxidise first and volatilise off or form a slag with the siliceous matter in the furnace bed, forming a slag which is removed. When the C. begins to oxidise it reacts on any remaining cuprous sulphide, according to the equation above, and at this stage the metal is known as dry C. This is stirred with poles of wood and anthracite thrown on the surface to reduce it thoroughly to the pure metal.

Wet Processes.—(a) *By displacement.* The burnt pyrites obtained from the manuf. of sulphuric acid contains from 3 to 4 per cent of C. It is not rich enough to be submitted to the smelting process, but it is ground and intimately mixed with 10 to 15 per cent of common salt. It is then roasted in a reverberatory furnace, a large amount of the iron being thus removed as ferric oxide, while the C. remains mainly in the form of cupric chloride. This is lixiviated with water and the C. salt goes into solution, and the C. is precipitated from this solution by means of scrap-iron: $\text{CuCl}_2 + \text{Fe} = \text{Cu} + \text{FeCl}_2$. (b) *Hydro-metallurgical.* Poor ores may sometimes be successfully treated by the hydro-metallurgical system, which consists in allowing the crushed ore

to weather in the presence of water. After some months, the C. will have become converted into soluble C. sulphate, which can be run off in solution and the C. extracted by precipitation with iron or by electrolysis. (c) *Electrolysis.* Although this method is sometimes used for obtaining C. from white metal, and even from the ore, yet it is usually employed as a means of refining the already purified metal. Such refinement is necessary for most of the purposes for which C. is used, especially in electricity. Commercial C. refined in this way is one of the purest commercial metals, its purity being about 99.9 per cent. Ingots of the metal are hung in a series of tanks containing a solution of C. sulphate acidified with sulphuric acid. These form the anodes, and thin sheets of pure C. which are also placed in form the cathodes, on which, as the current passes, pure C. is deposited. The impurities pass into solution, unless they are silver and gold, when they settle as a slime on the bottom of the tank. So this method is also used to recover silver and gold, as well as to produce a very pure C., and the value of the precious metals is frequently considerable.

Properties.—C. is a lustrous metal with a characteristic reddish-brown colour. This colour, however, is due to a thin film of oxide, and when the film is removed the colour of the pure metal is rosy pink. It is extremely tough metal, and can be drawn out into a thin wire or hammered into a thin leaf. Small impurities considerably reduce this high ductility and malleability. When heated nearly to its melting-point it becomes brittle and can be powdered. Its sp. gr. is 8.94 (approximately). It is only slowly acted upon by dry air at the ordinary temps., but in moist air containing carbon dioxide it becomes covered with a green basic carbonate. Heated in air or oxygen it forms black cupric oxide, which flakes off the surface in scales. When volatilised in the electric arc it gives a rich emerald-green vapour. It is readily acted upon by nitric acid, and while dilute sulphuric and hydrochloric acids slowly attack it in air, strong sulphuric acid, unless heated, has no action upon it. It is an extremely good electric conductor, being second only to silver, and it is therefore used extensively in cables, for electric telegraphy, lighting, etc. It is also used extensively in electrotyping, because of its property of being deposited in a coherent form from solutions of its salts when electrolysed.

Copper alloys may be classified into: (a) Alloys with small proportions of added elements. These include arsenical C., nickel C., and manganese C., all similar in properties to pure C. but of greater strength and elasticity, and on this account used in locomotive engineering; silicon C. and cadmium C., used as hard drawn wire for electrical purposes where strength and hardness are needed together with good conductivity. (b) Soft alloys of high ductility. These include cartridge brass, Admiralty brass, and Dutch metal, used respectively for tube drawing,

condenser tubes, and ornamental purposes. (c) Hard alloys of high elasticity. Wrought phosphor bronze is the typical alloy of this class. They are useful where elasticity and resistance to corrosion are required, as in small springs. (d) Alloys for high-speed machining. Alloys containing 3 parts of copper and 2 of zinc are suitable for this purpose, being cheaper and stronger than brass. (e) Munz metal or yellow metal is used as sheets for ships' sheathing. (f) High tensile brasses containing 50 to 60 per cent of Cu and 35 to 40 per cent of zinc, with small additions of aluminium, nickel, or manganese. They are similar to brass (d) in general characteristics, but harder and stronger, and do not vibrate under alternating stresses; hence they make good castings for marine propellers and pump rods.

See Copper Development Association, *Copper through the Ages*, 1934; E. D. Gardner, *Copper Mining in North America*, 1938; R. A. Wilkins and E. S. Bunn, *Copper and Copper Base Alloys*, 1943.

Copper Loss, in electric machines and transformers, the power lost in heating of the windings. The heat generated by a current I in a conductor of resistance R is RI^2 . This power is not only a loss, but the consequent rise in temperature beyond a certain limit weakens the insulation and may in the end cause breakdown. A maximum rise above ambient temp (less for plant to be used in tropical regions) is usually specified. The loss in cables and transmission lines usually called RI^2 loss—overhead—are often aluminium, not copper—but transformers (q.v.) (C. L. is used to distinguish the loss from iron losses due to hysteresis and eddy currents in the core.

Copperas, or **Melanterite**, is ferrous sulphate heptahydrate, known also as green vitriol. It is prepared on the large scale by exposing heaps of iron pyrites to the action of air and moisture. The liquor which drains away contains ferrous sulphate and sulphuric acid, and the latter is made into ferrous sulphate by adding scrap-iron. It forms pale green monosymmetric crystals, $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$, and is readily oxidised on exposure to the air. It is used for making ink, for dyeing, and as a dressing for crops.

Copperhead, see **MOCASIN SNAKE**.

Copperheads, term of opprobrium applied by men of the N. states of the U.S.A. during the Civil war to fellow Northerners who opposed the war policy of the Union Gov. Many of the latter did this because they did not believe it possible to conquer the Confederacy. In the later years of the conflict the term was largely applied to N. Democrats. In the U.S.A. there are two especially deadly snakes, the rattlesnake and the copperhead. The rattlesnake is popularly supposed to give warning when it is about to attack by rattling the cup-like horny attachments at the bottom of its tail, whereas the copperhead is a deadly silent hunter. Hence the popular origin of the term as applied to political opponents.

Coppermine River, riv., 475 m. long, in Mackenzie dist., Canada. The many

lacustrine expansions and rapids in its course render it useless for navigation. After a southerly direction as far as Lake Gras it turns NW., finally reaching Coronation Gulf, Arctic Ocean.

Copperplate, see **ENGRAVING**.

Coppet, a vil. on Lake Geneva, 8 m. NE. of Geneva, Switzerland. Here is the château where Necker and his daughter, Madame de Staël, spent part of their lives.

Copplee, see **COPSE**.

Copra, commercial and native name for the dried kernel of the coco-nut (q.v.). It contains up to 70 per cent. of oil, which is used in the manuf. of edible products and soap.

Coprinus, a genus of capped fungi known as the Ink-caps, family Agaricaceae, about 200 species. *C. comatus*, the Shaggy Cap, is a common edible species.

Coprolites, term applied to fossil excreta in the form of castings or faecal pellets; they sometimes reveal what animals ate. They are frequently used as artificial manure. In diameter they vary from 2 to 4 in., and they often contain a large quantity of phosphate of lime. Deposits in N. Africa and N. America are most important commercially, but C. are also found in the secondary and tertiary rocks of Suffolk and Cambs.

Copronymus, see **CONSTANTINE V**.

Copse, or **Coppice** (from *Gk kolophos* and Lat. *colpare*, to cut, through O. F. *copets*), small plantation of planted or self-sown trees, which are periodically cut over before they become timber-trees, either to beautify the landscape or more often for commercial reasons. Oak C. is valuable for making wheel-spokes, etc., ash for hurdles, hoops, and the handles of implements, hazel and willow for crates and hoops, and willow and osier for basket-making. Smaller pieces of C. wood, including chestnut, maple, elder, elm, and birch, are used in many countries for fuel and charcoal. See **FORESTRY**.

Coptic Language, the last stage of the ant. Egyptian with some admixture of Greek, especially in all that belongs to Christian doctrine, life, and worship. It was divided into four chief dialects: the Sahidic or Thebaic, the Akhmimic, the Bohairic (formerly called Memphis), and the Fayumic. The earliest of these was probably the Sahidic, while the Bohairic appeared later than the others but then assumed the first place. As Alexandria was the seat of the Coptic patriarch, Bohairic became the liturgical language of the Coptic Church; by degrees it replaced the other dialects, and ultimately (about the 14th cent.) drove them out. The Bible was trans. into no fewer than three dialects before the 4th cent. Hardly any of the C. literature is original. With the exception of some sermons of Shenute, a monk of Atrépe, it consists mainly of translations from the Greek. After the Arabian conquest in the 7th cent. the C. L. began to decline. The Copts continued to use their speech in daily life and as written language until the 13th cent. (although it lingered on until the 17th), and later as the liturgical language of their Church when Arabic had been

adopted as the speech of everyday life. Spoken Coptic, now called *Zeniyah*, has survived in some Christian villages of Upper Egypt.

Copts, native Christian descendants of the anct Egyptians. The name is the Europeanised form of the Arabic *Kubt*, which probably derives from the Gk *Aiguptoi* (Egyptians). There are about 1,000,000 Copts in Egypt. They are, in general, the best educated section of the community. The hist. of the C. is intimately bound up with their faith. They claim to have received the gospel from

of great interest to students of liturgiology, and has received a good deal of attention in recent times. Except for their Monophysite heresy the C. hold the faith in exactly the same form as the Gks, with whom they share in holding the single procession of the Holy Spirit. Some few C. are Rom. Catholics and Protestants. At the end of 1937 the Abyssinian Coptic Church, which since its foundation has been under the authority of the Coptic Church of Egypt—whose patriarch nominated the archbishop and bishops of the Abyssinian Church from the Egyptian clergy—broke away from the mother Church and claimed the status of an autocephalous body. The archbishop was deposed and the Abyssinian bishops elected one of their own members as the new *Abuna*. See also COPTIC LANGUAGE AND LITERATURE; ETHIOPIA.

Copula, term in logic which expresses the relation between the subject and predicate, and is always applied to the verb 'to be,' whether expressed or implied. Example: 'Life is short,' where 'is' is the C.; whilst in the sentence 'the child grows' the C. is implied in the verb grows, viz. 'is growing.'

Coppyhold, one of the anct laws of land tenure. It existed in England until very recent years, although much modified in form. C. may be defined as holding at will of the lord according to the custom of the manor, and dates back to feudal times. The lord of the manor bestowed a portion of his land on his labourers or villeins, who did him personal service in return for the land, which, however, often reverted back to the lord on the death of the tenant. Later on in hist. the tenant's right was observed, but many tiresome customs continued to survive, such as fines or heriots. C. was quite different from freehold in the manner in which it was conveyed. C. land was surrendered to the steward, who represented the lord of the manor; the steward then surrendered the C. to the new owner, and in each case the conveyance by surrender was made by a symbolical delivery. An Act passed in 1894 enabled C. (subject to the consent of the Board of Agriculture) to be converted into freehold. All C. land was enfranchised by the Law of Property Act, 1922, i.e. C. tenure, together with customary freehold tenure, was abolished on the terms specified in the Act.

Copying, general name given to the many processes employed for reproducing, either in actual size or on an enlarged or reduced scale, a drawing, map, plan, document, or other object, so that ideas and information may be recorded and widely circulated. Among the first people to experience the problem of C. were those responsible for teaching and spreading the Gospel, for they had no alternative but to copy by re-writing the text. For many it was a lifetime's task. The advent of printing (q.v.) from a copy set up in type marked the first stage in progress. In the early days of printing the preparation and setting-up of type was a slow, expensive, and highly skilled business which did



COPTIC PEASANT

L.N.A.

St. Mark, 1st bishop of Alexandria, but they were easily corrupted and embraced the Monophysite heresy. This was condemned by the Council of Chalcedon in 451, and immediately a fierce struggle arose between the orthodox and the heterodox. The orthodox party, being supported from Rome, were at first in the ascendant, and the Monophysites did not scruple to call in the Muslims to their aid. Thus came about the Muslim invasion in 640, and after a few years of Arabian rule the orthodox were almost entirely exterminated. A few still survive under the orthodox patriarch of Alexandria. The Coptic Christians in their turn were also cruelly oppressed by the Muslims, who forced them to submit to all kinds of degradation, and destroyed many of their churches. Having been thus cut off for so many centuries from the influence of the rest of Christendom, the Coptic Church has preserved its anct liturgies and customs almost intact. It is therefore

not meet the main need for copies from documents in their original form. This was first achieved in the early 18th cent. when a special C. ink was produced. An original prepared with this ink would yield a copy when pressed on to a damp blank sheet of paper. This process was improved by the invention of the iron C. press, and later the screw press, which produced better quality copies. These methods, though extremely slow, were fashionable for the next century and a half; then the invention of the typewriter (q.v.) so speeded the production of an original that it was possible to prepare it in about the time then required to make a copy by the press process. This challenge to inventiveness was duly accepted and resulted in the production of carbon paper which enabled copies to be prepared at the same time as the original. Carbon paper represented a great advance but had 2 major disadvantages, the limited number of readable copies and the difficulty of correcting errors made on the original and consequently on the copies.

The next stage in the development of C. was the invention of the hectographic gelatine process whereby the original was prepared with a special hectograph ink and the image was transferred by pressure to the gelatine bed. Successive copies were made by gently pressing sheets of blank paper on to the gelatine bed, thereby transferring the image of the paper. From this developed the hectographic process so commonly to-day. In the modern rotary process a special paper original, or master as it is commonly termed, is prepared by placing a sheet of hectographic carbon paper behind the paper so that a mirror image in hectographic carbon adheres to the back of the master. The master is placed on to a drum with the image facing outwards and the drum is then rotated either manually or electrically. At the same time blank sheets of paper are fed successively into the machine, where they are moistened with a quick-drying spirit before being forced into contact with the master, which leaves an impression on the moistened sheet. By this means up to 500 copies can be obtained from one master in a relatively short time. This is the only process to permit several colours to be copied at the same time. The use of different coloured carbon paper in preparing the master enables a copy bearing information in a variety of colours to be obtained from the one run through the machine.

In the late 19th cent. the ink stencil process came into being with the invention of a sheet of waxed paper into which could be cut the original information to be copied; a special wheel, a special pen, or a typewriter being used to cut the lines or letters into the waxed sheet. The waxed sheet was placed upon a flat bed on which ink had been thinly spread. A blank sheet of paper was then laid on top of the waxed sheet and forced by a roller into contact with it. This action caused sufficient ink to rise through the cuts to make an impression upon the

blank sheet. The flat bed was eventually replaced by a rotary machine wherein the master was placed around a drum containing ink which was forced through the cuts and then on to successive sheets of blank paper. Rotary stencil duplicators are now in common use, particularly for the reproduction of typed documents. They may be manually or electrically operated and the feeding of blank sheets is automatic. Up to 5000 good quality copies may be obtained from one waxed stencil.

The development of offset lithography (q.v.) machines represented a major step in the progress of C. These machines are similar in principle to the much larger type of machine used in printing works, the main difference being the use of masters that can be prepared by hand with a special ink, or by typewriter using a special ribbon. The masters can be thin metal plates or specially surfaced paper. The process is based upon the simple fact that oil and water do not mix. The special ink, or ribbon, contains an oily substance which is deposited upon the master when it is prepared. The master is fitted to a cylinder which is rotated and brings the master first into contact with a water-moistened roller and then into contact with an ink roller. Water adheres to the blank portions of the master only, whilst the ink adheres only to the oily image. This image is transferred to a rubber-covered drum which in turn transfers the impression to the blank sheets of paper which are automatically fed into the machine. Offset lithography is a fast process, printing at a speed of 6000 copies per hour. More than 500 copies can be obtained from a paper master and up to 50,000 copies from a metal plate.

Photocopying was another major development and to-day a variety of processes provide the answer to many C. problems. Brief details of the main processes now in use are as follows:

Reflex copying. The apparatus used consists of a box containing a glass screen behind which are exposure lamps. The document to be copied is placed face downwards on a sheet of sensitised paper and both are laid upon the glass screen, the sensitised paper in contact with the glass. The lid of the box is closed, pressing the paper against the glass. The lamps are switched on for a given number of seconds. The light passes through the sensitised paper, which takes the image from the reflection of the original above it. The exposed sensitised paper is then passed through a developing and finishing process from which it emerges as a white-on-black negative from which black-on-white copies can be obtained by repeating the reflex process using the negative as the original.

Dye-line process (now widely used to produce copies of engineers' and architects' drawings and also written or typed documents). This process requires the original to be prepared on transparent or translucent material. The C. paper, known as diazo paper, is coated with a

compound containing a dye which is sensitive to light. The original and a sheet of diazo paper are fed into an exposure box, or a rotary light source, and where light passes through the original to the diazo sheet it destroys the compound, leaving only a positive image of the original. The copy, or print, is developed by exposure to ammonia gas or by using a developing solution.

Blue print process. similar in principle to the dyeline process up to the development stage, but a different compound is used on the copy paper. The copy is developed in clean water.

Photostat. This process uses a camera but with sensitised paper instead of film. Copies obtained are negative, that is white-on-black, and can be made the same size as the original, or larger or smaller by adjusting the distance between the camera and the original.

Direct positive process (a contact process which produces black-on-white copies direct from black-on-white originals prepared on opaque paper). The original is placed upon a sheet of sensitised paper and exposed to the light. The copy is then passed through an automatic processor giving a positive copy. Double sided opaque originals can be copied by this method. A translucent copy can be made from an opaque original for subsequent use in the dyeline process.

Micro-photography is now extensively used for C. documents so that miniature copies may be distributed or stored instead of bulky originals. 16 mm. 35 mm. equipment is used in conjunction with cinematograph film. Many copies can be taken on to one spool of film at the rate of 200 copies per minute. After processing the films are stored for future reference, occupying only a fraction of the space that would otherwise be required. Reference to the copy is made by projecting the image on to a screen.

The various processes previously described have been concerned with obtaining a number of copies on one occasion, but there are particular C. problems which require that 1 or 2 copies of original information be made on numerous occasions. To meet this need a range of addressing equipment has been developed. The 2 main types in use employ in one case a metal plate and in the other a waxed stencil. In the metal plate system the information to be copied from time to time is impressed on to the plate by an embossing machine fitted with letters and figures formed as punches and dyes. The information is copied by placing the plate into a hand or electrically operated machine which forces it into contact through an inked ribbon with a sheet of paper or printed form, thus transferring the impression. The plates can be altered by flattening out the impressions and re-embossing. Waxed stencils may be produced by hand or typewriter. The equipment used in the stencil process is similar to that used for metal plates except that ink is forced through the master to leave an impression. *See also* LITHOGRAPHY; PHOTOGRAPHY; PRINTING.

Copyright in original literary and dramatic or musical works means the exclusive right to reproduce a work in any material form, to publish the work, perform it in public, broadcast it directly or through a rediffusion service, adapt it, dramatise it, translate it, or re-arrange it. Thus C. covers the right to perform a work or give any acoustic representation of a work or any visual representation of it by means of any mechanical instrument; and in the case of a pub. work, the sole right to publish the work or any substantial part of it. C. also includes the sole right to produce, reproduce, perform, or publish any trans. of a particular work, to convert a dramatic work into a novel or other non-dramatic work, to convert a novel or other non-dramatic work or any artistic work into a dramatic work, to make any record, film, or other contrivance for mechanically performing or delivering any literary, dramatic, or musical work, and to authorise any of the above acts. C. in artistic works covers reproduction in any material form, publishing, televising, and transmitting by rediffusion. The whole of the law of C. is now to be found in the Copyright Act, 1956, and the rules and orders in council made in pursuance of the Act. This Act received Royal Assent on 5 Nov. 1956, and came into force on 1 June 1957.

The Copyright Act, 1956, became necessary in view of developments since the 1911 Act which it superseded. It enables the U.K. to remain a member of the Berne International Copyright Union by ratifying the Brussels amendment of 1948 and to adhere to the new Universal Copyright Convention sponsored by UNESCO. By the Act of 1956 the whole of the Fine Arts Copyright Act, 1862, the Musical Copyright Acts, 1902 and 1906, and the Copyright Order Confirmation Act, 1922, were repealed, together with the Copyright Act, 1911, except sections 15, 34, and 37. Under section 15 of the 1911 Act, the obligation on publishers to send copies of their books to the Brit. Museum and, on request, to the Bodleian Library, Oxford, the Univ. Library, Cambridge, the National Library of Scotland, Edinburgh, Trinity College Library, Dublin, and, with provisos, to the National Library of Wales is continued, though (since the obligation has nothing to do with C. as such) it will not in future be part of the Copyright Act proper. As a result of the passing of the 1956 Act the assimilation of the law of C. throughout the Commonwealth and Empire achieved by the 1911 Act has to some extent been lost.

Under the 1956 Act C. subsists in an original work if either (a) it was first pub. in the U.K. or (b) the author is a 'qualified' person, i.e. either a Brit. subject or a person domiciled or resident in the U.K. Thus a work by a Brit. subject first pub. abroad obtains Brit. C. Progress in the art of mechanical representation and reproduction has led to the extension of C. protection to sound recordings, including gramophone records (50 years from pub.),

cinematograph film (50 years from registration or pub.), and sound and television broadcasts (50 years from making).

In regard to artistic works C. now consists of reproducing in any material form, publishing, televising, or transmitting by rediffusion. Architectural works if original are also protected; maps, charts, and plans under the 1956 Act are treated as artistic and not literary works. C. is not dependent (as e.g. in the U.S.A.) on registration in any form. In the case of literary, dramatic, or musical work the period of protection is, if pub. at the author's death, 50 years from the end of the year in which the author died; if unpublished at the author's death, 50 years from the end of the year in which it was first pub., performed, recorded, or broadcast. The proviso to section 3 of the 1911 Act under which anyone might pub. a C. work 25 years after the author's death on payment of a 10 per cent royalty has been abolished in conformity with the Brussels Convention of 1948; so have the compulsory licence arrangements (1911 Act, Sec. 4). C. in artistic works is as for literary works, except for works pub. by Gov. depts and photographs, C. in which expires 50 years after pub. *Prima facie* C. belongs to the author, but in a commissioned photograph it belongs to the commissioner. In work done for a newspaper or periodical in the course of employment under a contract of service, apprenticeship the newspaper or periodical rights belong to the paper and other rights to the author; otherwise work done in the course of employment in the absence of agreement to the contrary belongs to the employer. The bequest of an unpublished MS., unless otherwise stated in the will, carries with it ownership of the copyright. Unpublished copyright MSS. over 100 years old, housed in public institutions and whose author died more than 50 years ago, may, if the present copyright owner is unknown, be pub. on notice given under Board of Trade regulations. C. in anonymous and pseudonymous works extends for 50 years from pub., but if before that time the identity of the author can be estab., the ordinary term applies. C. in joint works now extends for 50 years after the death of the author who dies last.

The Act of 1956 also extends C. to a publisher's typographical arrangement for 25 years from pub. Pub. is defined as the issue of reproductions of the work to the public which must not be merely colourable but must be intended to satisfy the reasonable requirements of the public. Pub. in the U.K. or in any other Berne Union country is not treated as other than first pub. by reason of an earlier pub. elsewhere if the two pubs. take place within a period of 30 days. The performance or the issue of records of a dramatic or musical work, the construction of a work of architecture, or the issue of photographs of engravings or works of sculpture and architecture does not constitute pub. A dramatic or musical work is pub. only if copies of the play or musical composition in question are issued to the public. The unauthorised performance of a play, musical

piece, or any other work capable of representation necessarily amounts to an infringement of C. Fair dealing with any work for the purposes of private study, research, or criticism does not constitute infringement of C. Neither does the reporting of current events in a newspaper or periodical or by broadcasting or cinematograph film. The reading or recitation in public (other than by broadcasting) of any reasonable extract from a pub. literary or dramatic work is not a breach of C., although sufficient acknowledgement must be made. An author may, after parting with his C., make further use of any mould, sketch, or plan of his work, provided he does not repeat the main design of the work. Librarians of approved non-profit libraries may, under Board of Trade Regulations, supply to individuals for private study single copies of articles from periodicals or reasonable extracts from books without permission provided that the name and address of the person entitled to give such permission cannot be traced. C. material may be reproduced (other than by a duplicating process) in the course of instruction and in examination papers. It is an infringement of C. to permit for private gain a theatre or other place of entertainment to be used for the performance in public of a work without having obtained the consent of the owner of the C., unless the person so doing has no reasonable ground for suspecting that the performance would be an infringement. But certain performances in schools are defined as not being in public. The civil remedies for infringement of C. are an action of damages, together with a claim for an account of the profits, and if a repetition is apprehended the owner may also ask for an injunction. Furthermore all copies printed and pub. must be delivered up to the C. owner. The owner may also take proceedings where necessary to get possession, not only of all infringing or pirated copies of his work, but also of all plates used or intended to be used for the production of such infringing copies. An injunction may also be granted in the case of an unpublished work where the owner of the C. fears that his right is threatened or that an unauthorised pub. is intended. Under the Dramatic and Musical Performers' Protection Act, 1925, to make a record or film, directly or indirectly, from the performance of any dramatic or musical work without the written consent of the performers, or to sell or let for hire any record or film made in contravention of the Act or even to use for public performance any record or film so made, is an infringement of C. In the Second World War, the Patents, Designs, Copyright, Trade Marks (Emergency) Act, 1939, empowered the Comptroller-general of patents, etc., to grant licences for the exercise of the C.s owned by enemies or enemy subjects, and provision was made to maintain the validity of licences already obtained from enemy owners of C. when the war broke out.

The 1956 Act makes elaborate provisions governing the interaction of the new C.s in

sound recordings, films, and sound and television broadcasts, including the setting up of a new Performing Right Tribunal and a Television Copyright Organisation. Transitional provisions are detailed in the Seventh Schedule to the 1956 Act. In general they follow the principle that existing contracts are maintained, rights which have already lapsed are not revived, and potential rights under the former legislation which have not come into existence at the date of the new Act are not carried forward.

Registration at Stationers' Hall under the Act of 1842 terminated in Dec. 1923. In 1924 the Stationers' Company estab. a new register in which books and fine arts can be registered. A copy must be filed at Stationers' Hall and certified copies of the entries are issued: fees 6s. for a book, 2s. 6d. fine arts; certified copies in each case 6s. These copies are of use in giving evidence of the existence of work on a given date in case of infringement.

In U.S.A. C. law, registration is still necessary. The application for registration must specify whether the work in which C. is claimed is of the class of books, periodicals (including newspapers), dramatic or musical compositions, maps, works of art, or reproductions thereof, drawings or plastic works of a scientific character, photographs, prints, or pictorial illustration, motion pictures, motion picture photo-plays. Works not reasonably capable of falling under any of the above cannot be copyrighted. In 1923 C. legislation increased the C. fee for registration of all pub. works to \$2, the fee being previously \$1; but for an unpublished work the registration fee was \$1. Fees for most of the remaining C. services were also correspondingly increased. Registration fees for an unpublished work are now \$2, for a pub. work \$4. To secure registration: (1) the work must have been pub. in the U.S.A.; (2) two copies of the best ed. of the work must be sent to the C. Office, Library of Congress, Washington, promptly after pub. Books by Amer. authors must have been printed and bound in the U.S.A., but not books of foreign origin. Adherence by the U.K. to the Universal Copyright Convention made possible by the 1956 Act has been most important to Brit. authors and publishers, for without any formalities other than the printing of a copyright notice, e.g. ©, John Doe, 1958, a Brit. work in the Eng. language secures automatic copyright protection in the U.S.A.; the former requirement for manufacture of such books in the U.S.A. is abolished. The original term of C. is 28 years, but the author or his representative can, within 1 year prior to expiration, get a renewal for another 28 years, making 56 years in all. C. may be assigned by any instrument in writing.

International Copyright.—For the mutual protection of works circulated in countries other than that in which they were first pub., certain nations signed a convention at Berne in 1886. The signatories were Great Britain, France,

Germany, Belgium, Italy, Spain, Switzerland, Tunis, and Haiti, and subsequently Norway, Japan, and others joined the C. Union, but not the U.S.A., the Netherlands, or Russia. The basis of the Berne Convention was the reciprocal extension to foreign authors and publishers of similar rights to those enjoyed by native authors and publishers provided the formalities as to registration, etc., required by the country of first pub. were complied with. This convention was revised at Paris in 1896, at Berlin in 1908, at Rome in 1928, and at Brussels in 1948. The Rome text has practically superseded all previous texts; the Brussels text at 1 Jan. 1958 was effective only between 21 countries. The signatories to the Rome Convention include Great Britain and the countries of the Commonwealth and Empire (except New Zealand which still subscribes to the Berlin text), Austria, Finland, France, Greece, German Federal Republic, Spain, Denmark, Switzerland, Italy, Belgium, the Netherlands, Norway, Portugal, Poland, Sweden, Brazil, Monaco, Japan, and Liberia.

Modifications of the Berne Convention were made in its revised form in 1948, because of the increasing importance of broadcasting, television, film, and allied arts, and the convention now also protects the rights of authors in this domain. An author, for instance, may have the right (moral) to object to any distortion, mutilation, or other alteration of his work. He has also the exclusive right of authorising radio diffusion and communication to the public by loud-speaker or any other instrument of transmission. The convention has introduced a new provision that if legislation in his country permits, as in Belgium, the author shall enjoy the inalienable right to an interest in the sale of his work subsequent to its first disposal by him (*droit de suite*). Any dispute between countries concerning the interpretation or application of the convention is to be brought before the International Court of Justice.

The U.S.A. long remained outside international conventions other than the Pan-Amer. conventions between it and other Amer. states. This caused considerable confusion in international copyright which, in 1946, U.N.E.S.C.O. started to try to clear. By 1952 U.N.E.S.C.O. had succeeded in securing agreement to a Universal Copyright Convention by some 40 countries (excluding China and the U.S.S.R.). By early 1956 some 18 countries (including France, German Federal Republic, Japan, Pakistan, Switzerland, and the U.S.A.) had ratified the new convention. The Universal Copyright Convention does not affect previously existing C. conventions and that of Berne still stands. The purpose of the Universal Copyright Convention is to bridge, so far as international C. is concerned, the gap between countries of widely different legislation, culture, and development.

Under the convention each signatory agrees to give to artistic and literary works originating in the other countries

the same C. protection as it gives to such works of its own nationals, and it also lays down a minimum duration of copyright (author's life and 25 years, or 25 years from first pub. in countries calculating C. from pub. date). As previously noted, the importance of the Universal Copyright Convention to Brit. authors and publishers is that their works now gain C. protection in the U.S.A. by the use of the simple copyright notice laid down in the convention, namely the symbol ©, together with the name of the copyright owner and the year of first pub. Otherwise protection is gained throughout the Berne Union by simultaneous pub. in the U.S.A. and the author's country. Neither the U.S.S.R. nor China is bound by any international code.

See W. A. Copinger, *On the Law of Copyright*, 1870 (9th ed. in preparation, 1958); T. Dawson, *The Law of the Press*, 1927; A. Plant, *Economic Aspects of Copyright in Books*, 1934; H. A. Howell, *The Copyright Law (U.S.A.)*, 1942.

Copyright Libraries. Originating with a private transaction between Sir Thomas Bodley (q.v.) and the Stationers' Company in 1610, the first Act on the deposit of books came into effect in 1662 in favour of 3 libraries—the Royal Library, and these of the univs. of Oxford and Cambridge. This number has varied in the past, though it has always been consi-

necessary for 1 copy to be deposited in the Brit. Museum. In 1710 the number was increased to 9 owing to the Union with Scotland; the Union with Ireland increasing it again to 11. The Act of 1837 decreased it to 5. Then the Imperial Copyright Act of 1911 gave, with certain exceptions, an extra copy for the National Library of Wales. The Irish Rep. has its own copyright law.

As it now stands (section 15 of the 1911 Act, which is not repealed by the 1956 Act), 1 copy of every new book pub. in the U.K. must be deposited at the Brit. Museum within 1 month of pub. If written demand be made to the publisher within 12 months of pub. of the work, 4 complete copies must be sent to the agency named on behalf of the Bodleian Library, Oxford, the Univ. Library, Cambridge, the National Library of Scotland, and also Trinity College, Dublin (q.v.). A further copy of the work may be demanded for the National Library of Wales (q.v.).

In other countries the number of deposit copies required by law varies greatly. In Switzerland it is voluntary; Norway, Denmark, etc., require only 1; France, 2; Poland, 7; Portugal, 13; Rumania, 15; 'but the Soviet Republic of Ukraine demands 50 or more copies of each new work.'

See R. C. B. Partridge, *The History of the Legal Deposit of Books*, Library Association, 1938. See also COPYRIGHT.

